THE AMERICAN ENGINEER

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The National Society of Professional Engineers

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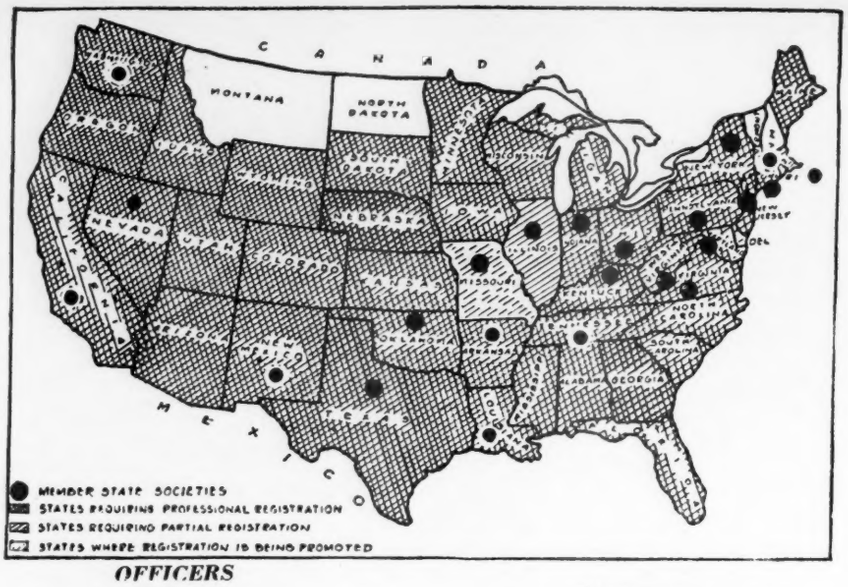

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THE COVER

The cover shows a facsimile of the pin of the National Society of Professional Engineers. We encourage members to wear this pin constantly.

THE AMERICAN ENGINEER will from time to time attempt to record on its cover major incidents of national and international character so that files of the magazine in the future may be a picture record of such events. We will be glad to receive from our members suggestions as to covers, and if you care to send us photographs which you think may be of interest, we would be happy to receive them.

The American Engineer assumes no responsibility for statements or opinions expressed by contributors. Their names identify the source of the same.

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EDITORIAL • • •

ENDOWMENT

Among the objectives and purposes of the National Society of Professional Engineers are the promotion of the welfare of the profession, as such, and giving aid and assistance to distressed members, or for other "engineering welfare" — group help and individual help.

A young, growing organization does not quickly become financially able, through collection of dues of its members, to build up a fund which may be used either directly or by the employment of the money return it may earn through investment. It must therefore turn to other sources of income, if it is to accomplish those "welfare" objectives.

At the most recent meeting of the directors of the National Society, the creation of an Endowment or Trust was discussed, and plans formulated to bring it about.

We have done much for the profession, but not so much as we had hoped for ENGINEERS. Such a Trust must be surrounded by safeguards to adequately administer it. What more satisfying way of helping engineering than to donate to an endowment or trust devoted to the professional engineer and his welfare.

No profession has done more for human well being than engineering—none has been more unselfish—none is more deserving of help for its members.

The Society will welcome the giving of sums from those within the profession and those without. The sums will be safeguarded by all reasonable means, administered by specially elected Trustees, and devoted to the uses that their donors desire.

High "returns" on capital are not common practice today. But what higher return could one interested in the profession receive than the satisfaction of knowing that the sums of money given would be administered by ENGINEERS FOR ENGINEERS!

We encourage such gifts and welcome them.

ROBERT HALL CRAIG
Editor

CONVENTION NEWS

New Jersey Association of Professional Engineers and Land Surveyors

1939 Convention Committee for 19th Annual Convention Held Jan. 13-14 in Newark, N. J.

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Elected at New Jersey Convention

George Randolph
Trustee at Large, 1938-1939, New Jersey Society
Director, National Society

Born, July 22, 1884, at Freehold, New Jersey.

Graduate, Princeton University, June, 1907. Degree of Civil Engineer.

Has been in private practice since graduation specializing in municipal and highway engineering.

Captain, Engineers Corps, A. E. F.—1917 to 1919.

Member and Past President, Monmouth-Ocean County chapter.

Member and Past President, New Jersey Association of Professional Engineers and Land Surveyors.

Member and Director, National Society of Professional Engineers.

Member, Red Bank Lodge No. 242, F. and A. M.

The Texas Society of Professional Engineers Holds Its Third Annual Meeting

The Texas Society of Professional Engineers held its third annual meeting at Austin, Texas on January 28, 1939, as guests of the Travis Chapter.

The program of the meeting included an inspection trip to the site of the Tom Miller Dam on the Colorado River. This dam is at the City Limits of Austin and is the fourth of the series of dams being built on this river by the Lower Colorado River Authority.

In the evening, after the cocktail hour, 135 members and guests sat down to dinner in the Stephen F. Austin Hotel. Major E. A. Wood, Director of the State Planning Board was the principal speaker on the subject, "The Engineer and the Resources of Texas."

In his talk, Major Wood reviewed the work of the Planning Board and exhibited samples of the little known minerals and mineral products produced within the state. He indicated that the limited resources of the Planning Board did not permit a complete survey of the resources of the state and that it was necessary for them to secure information from any sources available. He urged that the Engineers of the state could supply very valuable information to the Board if they would report mineral deposits and developments which they encounter in their travels. The opportunities of mineral and industrial development have been barely touched as yet and there is

(Continued on page 5)

The Consulting Engineer: His Position In The Profession and the Nature of His Work

An address written for students of Fenn College, Cleveland, Ohio, by Wilbur J. Watson, Doctor of Engineering and member of the Ohio Society of Professional Engineers

Dr. J. A. L. Waddell, one of the pre-eminent consulting bridge engineers of America, declared, that it took "a good deal of nerve to occupy the position of consulting bridge engineer, for in good times the bridge specialist can earn a fair amount of money, of which he has to spend from one-half to two-thirds to pay his assistants and the running expenses of his office; in bad times he has to carry on at a loss, for it does not do, when the hard times come, to discharge all of one's office force, because, when business improves, an engineer who does so would not be in a position to take advantage of the work that he could secure."[1]

Before we discuss the work of the consulting engineer, it is necessary to define terms which are constantly used. In ancient times there was no differentiation between the work of the architect and that of the engineer; up to the Middle Ages architecture alone was recognized as a profession, and it naturally included civil engineering work. The Greek word "Architecton" means "Master Builder," and the Romans borrowed the same word from the Greeks. But both of these two ancient civilizations had army officers who did engineering work without titles,—men who correspond to the military engineers of our time. Such a man was Julius Caesar, who, with his corps of soldiers, planned and erected the famous bridge over the Rhine. We also know that Alexander the Great had an officer in his army who designed and executed such astonishing engineering projects that he thereby attained great fame and fortune, becoming a favorite of his sovereign's. The earliest extant record of the use of the word "Engineer" in English is to be found in connection with the building of an old bridge over the Dee at Chester. The work was carried out by a Frenchman, called Richard L'Engineur, about 1300. It was he who also constructed, next to the bridge, the Dee mills which have obtained immortality through the well-known folksong, *The Jolly Miller of Dee.* Thus it happened that the word "Engineer" entered our language through the French in the Middle Ages and meant, at that time, the erection of buildings, bridges, harbors,—the type of work which we call "Civil Engineering." The word "Civil" first appeared around the middle of the eighteenth century, when science was beginning to achieve recognition, and introduced in order to distinguish the work of this branch of engineering from that of military engineering,—a distinction that still exists. The civil engineer is thus in essence a creator of peaceful arts; he designs and executes civic projects that flourish in times of uninterrupted progress. For instance, the beautiful Greek temples and great public buildings were built in the golden age of Pericles; the Roman coliseums, forums, and acqueducts in the quiet reign of Augustus; the domestic buildings of England in the Renaissance; the famous bridges and feats of modern structural science in the peaceful nineteenth century before the outbreak of the World War.

The nineteenth century brought with it marvelous scientific advancements; civil engineering kept expanding to include mechanical, electrical, mining engineering, and so on. Up to that time, *i.e.* until about one hundred and fifty years ago, there was no very clear demarcation between engineering and architecture; the two overlapped, and the profession of engineering embraced an enormous amount of theoretical and applied science and art. As this body of knowledge grew, it naturally became necessary to break it up into smaller segments, and thus we arrive at the age of specialization, for the same phenomenon was taking place in all other branches of knowledge as well. Then appeared the mechanical engineer, the electrical engineer, the mining engineer; and in recent times, following the tendency for even greater specialization, these large families of engineering have broken up into species: for instance, distinguished under the "Civils" are bridge engineers, structural engineers (those engaged in building work), hydraulic engineers, sanitary engineers, highway engineers, and on *ad absurdum.* Probably such division of professions is necessary to meet modern conditions, but it should not be forgotten that these are all dependent upon the main trunk which is Civil Engineering.

Moreover, we should not forget that in any branch or kind of engineering there is need today, more than ever before, for engineers who have an understanding of the broad underlying human or social problems that confront us at every turn. These engineers have produced marvelous machines and techniques of production; now they are sorely needed in solving of other, farm more difficult problems. In order to correlate and integrate science and humanism, the engineer must join the sociologist, the philosopher, the artist, and the historian, in an attempt to advance the world's knowledge to such a point that a more nearly complete picture of life as a whole may be realized.

Now to return to the highly specialized branch of consulting engineering. The term is a misnomer, for in reality most of the "consulting engineers" are actually "practicing engineers." This, I believe, should be the distinction between the consulting and the practicing engineer: the word "consulting" should indicate a person called upon to give advice on certain subjects in which he has, by his experience or by his training, or both, attained unusually high proficiency and wisdom. The "practicing engineer" should designate a person engaged in solving the ordinary problems of the profession, such as, for "Civils," the design and construction of engineering projects,—bridges, dams, water works, sewage treatment plants, etc. Notice that both of these terms are not limited in their application to any one field of engineering but are applicable to all branches of engineering, whether it be civil, mechanical, metallurgical, or any other of the well-known branches.

Because the consulting engineer must amass an amazing collection of highly specialized knowledge in his field of engineering, it is impossible to outline a detailed course of study which would apply equally well to a student of civil engineering and to one of mining. Obviously, the student must learn all he can from others in his field, but he must take great care not to let the pursuit of specialized knowledge crowd out his general education. The foundation of education for a successful engineer must be well laid in

[1] **Waddell, J. A. L.: Memoirs and Addresses of Two Decades, ed. by F. W. Skinner (Easton, Pa., 1928), p. 124, from an address on "The Bridge Engineer and his Work."**

the broad principles of engineering fundamentals, which form not only the sure means for higher and more specialized knowledge, but which are continuously practicable in all angles of the profession. It must be remembered that engineering is a learned profession which demands long and arduous training. However, it has one very important advantage over many of the other professions: in the process of engineering education, the student acquires a habit of reasoning objectively, and he learns to maintain an active, inquisitive mind. In other words, the engineer, as a result of his training, should have a fine reasoning faculty.

Moreover, it is important that the student cultivate the so-called liberal or humanistic studies; American engineers are frequently handicapped because they know so little outside of their own sphere of knowledge. The undergraduate would do well to equip himself with modern languages, knowledge of which is of infinite value especially to the consulting engineer, who is essentially a research worker all of his life and must have the tools of research; courses in writing and speaking his own tongue, for the ability to express himself well is a great asset; a broad knowledge of history and archeology; philosophy, psychology, and sociology; applied arts and crafts. Surely there is in this list ample room for the indulgence of personal tastes and predilections.

But when the period of training in technical schools and colleges is completed, then the problem of obtaining experience must be solved. It should be recognized that under present industrial conditions by far the greater proportion of engineers must expect to be salaried employes of corporations or of the various units of the government. There has been a marked expansion of governmental activities in the field of engineering during the past few years, due to the rapid development of highway construction. As a matter of fact, highway construction has reached the point where it should be recognized as a branch of civil engineering on a par with bridge engineering, water works engineering, etc. One result of this expansion of government activities has been to limit the field of practicing and consulting engineers in certain lines, such as bridge work, because the state highway departments, which are now highly organized, usually include staffs devoted to the design of bridges and employ dozens of trained engineers in this work. Consequently, consulting engineers are called upon for help by the highway departments only in case of unusually difficult projects. At the same time it should be recognized that, while this situation has somewhat limited the field for consulting engineers, it has increased greatly the opportunities for employing younger men of the profession.

Similarly, the great corporations, such as United States Steel Corporation, because of their own thoroughly organized departments of engineering, seldom find it necessary to call upon consulting engineers for assistance. There are, however, very many smaller corporations that do not maintain their own engineering forces and are, consequently, in the habit of calling regularly upon outside organizations to solve their engineering problems for them. Great railroad systems also have well organized departments of engineering where good experience may be obtained by the young engineer. In all events, let him obtain various positions, which will enrich and crystallize the knowledge acquired in school and college.

In other words, the young engineer, seeking to become a consulting engineer, must advance both his theoretical and practical knowledge constantly. Post-graduate courses will aid him greatly, and he will receive further intellectual stimulus from the technical societies where he will meet fellow-comrades, as well as the masters of his field, and hear learned discussions. Most of the leading consulting engineers are members of the American Institute of Consulting Engineers, a group composed of about one hundred men of national reputation. For civils, the great national Society of Civil Engineers is of course taken for granted. There are about fifteen thousand members of the Society in the United States, with local chapters and student groups organized in the large cities and in most of the engineering schools. In the last few years there has appeared another national organization,—the National Society of Professional Engineers. Associated with this national society are various state and local organizations. This Society does not specialize in publishing technical data but is primarily concerned in the promotion of what might be called "welfare work" among engineers,—raising standards of salaries especially for younger men and establishing codes of ethics and so on. Naturally, this organization numbers among its membership many of the younger men in the profession, especially those engaged in governmental work.

Successful consulting engineers are those who, through untiring study and long years of successful accomplishment, have established a national reputation for proficiency in some particular line of work; they are the men who stand at the top of their especial field. Their work consists of helping other engineers and engineering departments. For such work they are paid a consulting fee that is independent of other fees paid for design and supervision. Generally, consulting engineers are associated in partnerships, and they are men well along in years who have had a great deal of experience in engineering work. A few examples of such engineers are Ralph Modjeski, the bridge engineer, Ole Singstad, tunnel expert, Metcalf and Eddy, sanitary engineers, Arthur Morgan, flood control, etc.

Then there are the practicing engineers, often referred to as consulting engineers. These are the men or firms that undertake to design and supervise construction of engineering works. Naturally, they form a much larger group than do the true consulting engineers, although the latter also undertake, in most instances, to design and supervise construction. The difference between these two classes is mainly one of professional standing. Most of the practicing engineers are employed by large corporations or by the government. Some of these, however, stand at the top of their profession and deserve to be classified among the great engineers of their time. Other great engineers are with the railroads or with well-known bridge companies; some are government employees working on the construction of huge dams and other reclamation works which require the highest degree of engineering skill. Many engineers have become successful contractors and are outstanding because the erection of modern engineering work demands high technical proficiency. All of these engineers who have contributed creatively to the progress of engineering science are, in the broadest sense, consulting engineers.

The Texas Society of Professional Engineers

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plenty of material for great economic strides by Texas Engineers if they will avail themselves of the opportunities.

Following Major Wood, the Travis Chapter furnished some light entertainment before the business session of the meeting opened under the direction of retiring president W. E. Simpson of San Antonio.

The reports of the committees were received and approved and the officers for the coming year were inaugurated with a brief ceremony. These new officers were as follows: President—Fred E. Rightor, Vice-President—Walter E. Seaholm. Vice-President—John D. Miller, Directors—J. T. L. McNew, Julian Montgomery, T. B. Warden, E. C. H. Bantel.

Vice-President J. W. Beretta of the National Society discussed the progress of the past year and the new president Engineer Rightor took charge of the meeting. The remainder of the evening was taken up with lively discussion of proposed legislation which might effect the welfare of the Engineers and of the problem of interesting young graduates of engineering schools in the future of their chosen profession.

(Signed) D. V. Purington

The Engineer's Place In Civilization

By **D. B. STEINMAN**

The Engineer is a builder. He builds his dreams and the dreams of his fellowmen into enduring realities.

The Engineer is the architect of progress,—giving to civilization its form.

The Engineer is God's Journeyman,—continuing the work of creation.

There is a beautiful and impressive legend,—so old that its origin has been forgotten. It goes like this:

Four men stood up with God when he made the World. They saw the nebulous mass take form under the hand of the Creator; and they watched with wonder as the shimmering sphere, flung from the fingers of Omnipotence, found its place in the shining galaxy of stars.

Blinded by the sublime spectacle, the men fell down in humble worship. And God said to them: "Rise, and fear not." And they rose and faced the Master with the new-born questions and ambitions that fired their souls.

And one of the men asked: "How was it done " And God replied: "Go, find out for yourself." And that man went and became the *Scientist.*

"Give it to me," the second man begged. And God said to him: "Go, possess it for yourself." And he went and became the *Business Man.*

"How beautiful " exclaimed the third man. To him God said: "You shall go and, because your soul burns within you, you shall create Beauty " And that man went and became the *Artist.*

The fourth man said nothing but, as his eyes followed the unfolding of the plan of Creation, there kindled in his heart a desire to do these things. And to him God said: "You, too, shall go, and you shall plan and build. You shall learn to master the forces I have called forth, and you shall *continue the work of Creation!*" And that man went and became the *Engineer.*

And thus this noble group of God's Journeymen set out upon their appointed tasks. The Engineer ran before the others to straighten the path for their feet. He blazed the trail through trackless forest and impenetrable jungle, over jagged mountains and across torrential streams. He cleared away obstacles, broke down barriers, and spanned the chasms that halted their progress. He explored the far places and the depths of the Earth for the materials the Journeymen needed, and he fashioned the tools for their work. He devised shelters to protect them from the elemental forces of Air, Earth, Fire, and Water, and he harnessed these to lighten the toil of Man. With head and heart and hand, he wrought and contrived to ease the tasks of his fellow Journeymen and to multiply the fruits of their labors.

The others leaned heavily upon the Engineer when the going was rough. He crystallized their visions and gave fruition to their efforts. He labored and delved for the Scientist, and harnessed his magic to ways of usefulness. He helped the Business Man find new Wealth, and with it he created the structure of industry and commerce. He furnished new materials and tools to the Artist, and made his dreams of Beauty materialize in imperishable form.

With the Truths discovered by the Scientist, the Wealth garnered by the Business Man, and the Beauty dreamed by the Artist, the Engineer performed even greater miracles—rearing the resplendent structure of Civilization and Human Progress.

And thus the Engineer goes on through the ages—overcoming obstacles, conquering new forces, and reshaping the physical world. Unsparing of his energy, he plans and toils to create comfort, wealth and happiness for his fellow-wayfarers. He is the pioneer and the leader in the onward march of Civilization.

With the successful achievement of each new monumental task, the Engineer has grown in strength, and greater responsibilities and talents have been entrusted to him. Today he has to be Scientist, Artist and Business Man, as well as Engineer. All four are now embodied in him and find expression in his creative genius. He works from vision to deed, and he applies Science and Business and Art in building his dreams into enduring realities. He plans and builds not only for his time, but for the generations to follow.

Truly, *the Engineer is God's Journeyman, continuing the work of Creation.*

The Engineer is a builder. Men may fight and destroy for a time, but they can build forever.

After the devastation of a world war, the Engineer was the only hope of a shattered world to reconstruct it from its ruins.

After the devastation of an economic crash, the Engineer again is the only hope of a shattered world in the work of reconstruction of the industrial machine and restoration of constructive endeavor.

The Engineer is applying his brain power and inventive genius to one end,—the onward march of civilization and human progress!

The Engineer is not only a builder—but he is also charged with developing Nature's resources of power and energy and harnessing them in the service of Mankind.

When James Watt observed the power of steam in his mother's teakettle and conceived the idea of harnessing this power for the uses of Man, few in his time dreamed that this was to usher in a worldwide industrial transformation with increased production, energy, wealth, comforts, and culture for all.

A century ago, when Michael Faraday was demonstrating his rudimentary discoveries with magnets and coils of wire before the Royal Institution, the Prime Minister of England asked "What is the use of these things?" Today the electrical industry gives employment and livelihood to millions; and countless millions more owe their improved comforts and standards of living to those early discoveries of electromagnetism as developed and made useful by the work of subsequent generations of scientists and engineers.

Such discoveries of Science, when developed and harnessed by the Engineer, have brought about new modes of life and enhanced standards of living, so that the average man today enjoys comforts, conveniences, and even luxuries that were undreamed of by the wealthiest emperors and potentates of the past. The luxuries of yesterday have become the necessities of today. The dreams of our fathers have become our every-day realities.

As pointed out by Dr. Karl T. Compton,—Energy is wealth. The wealth level of Mankind is determined by the development, control and use of energy.

The machine liberates and replaces the human slave.

The great Dynasties in Egypt, the Golden Age in Greece, the Roman Empire, and the Renaissance in Europe were great eras of the past in which literature, art, and philosophy flourished. But they were founded on slavery and feudalism. The great developments and cultural advantages in those periods were made possible because people possessed cheap energy provided by the sweat and toil of great numbers of human serfs. Those slaves were driven like machines to produce the wealth which enabled the fortunate few to follow intellectual pursuits.

In our day, modern machinery and invention have given to every man, woman and child in this country the equivalent power and services of fifty slaves!

Science and Engineering have liberated Man from slavery and serfdom, and have given us new resources of power and energy for creative work, for culture, and for re-creative leisure. A Golden Era of Progress such as Civilization has never before known has now been made possible. What humanity will do with the new opportunities, leisure, and resources is beyond our ken.

Mankind is ever struggling onward, and each gain in science or in technology increases the certainty of further advance.

Engineering progress has been proceeding at an accelerated pace. Each generation records advances that eclipse the progress of all the centuries preceding. Within our own lifetime, all the external conditions under which man lives his life on earth have been more completely revolutionized than during all the ages of recorded history which preceded.

There is no indication that we must expect a halt in progress, whether of invention or productive efficiency. Increased efficiency, the further advance of Engineering and the creation of new things, will go on without interruption.

There is one fundamental truth that should be kept ever before us. It is this:

Only as we increase the capacity of each of us to produce the goods and services we require can we hope to raise the general standard of living. There is no other way!

The machine supplies the leverage for increasing Man's effectiveness.

Technological invention has made it possible for one man to do the work of three. That one now draws the pay that the three formerly did, and he works only eight hours a day instead of 14 or 16.

Technological invention has opened employment in new creative industries and in related service activities. The machine has opened far more employment opportunities than it has closed.

Longer periods of education and earlier retirement from labor, shorter hours of work and more leisure for culture and play, fewer years of work and fewer wage earners per family, the release of youth and old age, from the necessity to earn wages,—these things also represent improvement in the general standard of living. If our machine economy produces these results, they should be recognized as a blessing.

The future of Engineering is to be gauged not by the past but by the problems still unsolved and the possibilities yet to be explored.

Engineering is the agent that has transferred toil from muscle to machine. It is Engineering that has overcome Nature's obstacles and hostile forces.

(Continued on page 23)

Engineering Education of Tomorrow

A Paper Delivered at the Annual Meeting of the Ohio Society of Professional Engineers, in Cincinnati, Ohio, February 9, 1939

By **R. S. TOUR**

The engineer has suddenly come to realize that he gets but little credit and no thanks for the development of our present day civilization with its comforts, its comparative ease and its high standards of living, all of which are largely the result of his efforts. The layman who receives the benefits does not class engineering as a learned profession nor the engineer as his benefactor. The community, as the ultimate employer of the engineer, rewards him with but a meager salary for his gifts to civilization and denies him the purchasing power for many of the modern luxuries which he himself created. The results of his non-recognition may seem trivial and the engineer himself may argue that they matter very little since his gratification will come from work satisfactorily accomplished. But the situation is really important to both the engineer and to the community. Except for the occasional genius, the human being is not constituted so as to do his best work if that work goes unrecognized, or if he feels, even subconsciously, that but a small share of his efforts are reflected in his own improved lot. The civilized community apparently does not realize that this anomalous situation exists to its own disadvantage.

In some ways, the engineer has himself to blame for his plight. He has permitted any Tom, Dick or Harry to title himself Engineer in performing services which cannot possibly be classed as engineering. And he has not in the past concerned himself about individuals actually practicing engineering without proper qualifications, training or experience. In a heroic attempt to correct this phase of a bad situation, the engineer has sponsored and obtained enactment of the new registration laws now effective in most of the states. These registration laws are or should be but the beginning of an enforced respect for the title, the practice, and the profession of the engineer. As the inertia of tradition is overcome, the laws and requirements governing the public practice of engineering will, no doubt, become increasingly stringent.

However, respect enforced by law is still unsatisfactory. Prestige and honor cannot be decreed by statute. The engineer must go much further in bringing his profession up to its desired status, both for his own benefit and for the good of the community. He must look within his own ranks and make sure that not merely a few but the great majority of his brother engineers are of such calibre and ability that as individuals they command the respect and honor of their community. Graduation by an engineering school does not in itself entitle a man to special consideration by society in these days of comparatively free and easy education. If his work is routine, his accomplishments nil, his promise negative, the engineering profession as a whole loses prestige by allowing him to use the title, Engineer: this in spite of the fact that his work may be associated with engineering. Just so is the nurse associated with the physician but she cannot classify herself as a doctor. Rightly or wrongly, the honor and respect the community offers the engineer will depend upon the extent to which he separates himself as a class apart from his helpers and his assistants. But before this phase of professional differentiation can be attempted, the engineering profession must prepare itself for the program.

Accrediting of Engineering Schools

As the first step toward his own salvation, the engineer must be assured that the new blood entering his profession has the proper training and preparation for the duties to be undertaken, a training that will help to eliminate the unfit and will deliver into the fold only those properly equipped, technically and temperamentally. In short, the engineer must investigate the teaching of engineering in the schools of the country and give his blessing only to those schools which he considers to be fulfilling their duties to the engineering profession. But he must be extremely careful in properly defining "duties to the profession;" his definition must include duties to the community and to industry. A system of accrediting schools will carry weight only if it proves itself for the good of the community. Then, and only then, will the non-accredited schools cease to be an important factor in the development of the engineering profession.

Other professions have definitely improved their status by a system of accrediting schools. But the process of accrediting is much less simple for engineers than it is for those professions in public practice offering service to individuals, where protective statutes may be invoked. Except for the small proportion of consulting engineers, the profession is dependent on industry for its employment and industry's demands must be satisfied. If, in the process of accrediting, the output of graduates from approved schools becomes insufficient to meet demands, industry will certainly accept graduates from other schools, since the immediate positions to be filled do not generally require training of high order. Then the non-accredited schools will continue to flourish, and the accrediting system will have become a boomerang. The accrediting of schools will succeed in raising the standards of engineering education only if the profession is unselfish, impartial, and sensible in its policies of accrediting. In the last analysis, industry alone will be the arbiter of acceptance for graduates, and the engineering profession must take care to avoid embarrassment.

One of the duties, perhaps the major one, assigned by the national engineering societies to their Engineers' Council for Professional Development is that of accrediting engineering schools. All decisions presumably are left to the Council, which functions without direct instruction from the parent societies, except in the case of chemical engineering. The American Institute of Chemical Engineers has long maintained a powerful Committee on Chemical Engineering Education which started investigation of engineering schools as early as 1922. This committee stipulated the requirements under which schools should be approved and in 1925 fourteen schools were accredited. The list has since grown to only twenty-eight, representing but about one-quarter of the schools teaching chemical engineering in the country. This list of twenty-eight schools is the one adopted by the Council for accrediting schools in chemical engineering. The accrediting procedure of the Institute of Chemical Engineers has been stringent but carefully administered, and has aided immeasurably in improving chemical engineering education.

What constitutes a good engineering school? Naturally, the faculty must be capable and sufficient. Also the physical facilities in class rooms and laboratories must be modern and adequate. These are simple specifications, easily checked for any school. But the proper college curriculum cannot be so easily defined. There has been much discussion about the desirability of so-called cultural subjects in an engineering curriculum, the importance of English, and the need for courses in economics, finance, government, etc., so that the engineer could better cope with the social problems of the mechanized civilization he has helped to create. An argument against these demands has always been that inclusion of such subjects must be at the expense of technical courses which cannot be spared. These two schools of thought, although opposed, both understand the other's point of view, both concede the importance of the other's argument, and both admit that the time available is inadequate to offer both humanistic courses and advanced engineering training to the prospective graduate. Are both the opposing arguments valid? Perhaps the more advanced technical subjects now considered so necessary in engineering curricula are really not essential for the average engineering graduate. A first consideration in an attempt to improve the engineering curricula of today should be the value received by present graduates as a result of their education. One of the criteria for value received would seem to be the monetary compensation offered by the community to the college graduate in return for his schooling.

Monetary Value of College Education

Based on a survey prepared by the U. S. Bureau of Labor Statistics*, figures submitted by about 28,000 engineers (75% graduates, 25% non-graduates) in this country indicate that the average 1934 income of college graduates (all ages and all salary brackets) in engineering was less than 10% greater than that of non-graduates. In prosperous 1929 the differential in the lower salary brackets was even smaller. This credit of 10% or less is in itself high since a large fraction of the non-graduates are inherently weak men who have failed in school, or lacked either the stamina or capacity to acquire a college training. There is left but little credit due to schooling. And when interest on the investment and four years loss of earnings are charged against the education, there is doubt of any financial advantage. Of course, a college degree permits easier entree to these poorly paid positions, in fact the degree is required in many cases. But under the circumstances, such a requirement is no credit to the college education.

The statistics for 1934 further indicate that half of the engineers, ten years after graduation, earned less than $210 per month, while after twenty years they earned less than $300. Such figures should shock engineering educators and the professional engineers of this country in their aspirations to a "learned" status. Either there is something wrong with engineering education or with the positions to which graduates are assigned; the two are obviously not matched. Based on the accepted definition of engineering, "the utilization and application of the materials and energies of nature in the service of man," there is little question that the reputable engineering schools of the country are teaching engineering in its truest sense, perhaps too much so. Does the engineering graduate in industrial practice have occasion to use much of his school training, does he really practice engineering according to the definition? Does the civil engineer who turns surveyor, the mechanical engineer who becomes a draftsman, the chemical engineer who is a laboratory technician, or the electrical engineer as a substation operator need a college training or a degree to carry on his work? This and similar assignments constitute a large portion of so-called engineering practice today, work essential to civilization but not creative, not in itself progressive, and in no sense

* "Monthly Earnings of Engineers" in Electrical Engineering for December 1937, p. 1450.

"learned." These duties may be classed in a "service" branch of technical employment as distinct from "creative" or professional engineering. The former needs and uses but little of the engineering education offered in the schools today, while the education of the standard curriculum is no longer adequate for the latter.

The engineer belongs primarily to the employed class. His compensation depends on the will of his employer who in turn is governed mainly by supply and demand. In so far as possible, industry will gladly employ college graduates, to do routine work but the remuneration will be only for the work done. Here is an explanation of the small or negligible differential creditable to a college education. And, among the employees in the service branch of his organization, the employer may find the very few men needed and suitable for creative engineering work. The employer thus has everything to gain and little to lose by a system of engineering education which turns out a large mass of graduates quite uniformly prepared. Under this system, all engineering graduates are generally employed (except in depressions) and the schools feel they have done their duty to the community. With 100% employment following graduation, the schools may feel that their curricula are satisfactory and the number of graduates not excessive. However, when statistics assign less than 10% income value to the technical education, the engineering profession must still feel disturbed.

Limiting School Enrollments

One solution often suggested is that engineering schools limit their enrollments and decrease the number of graduates. In support of this argument, figures are quoted comparing 1890 with 1930 as to the number of graduates in the profession, the enrollment in engineering schools, and the size of graduating classes. Such figures are misleading. In 1890, engineering education was in its infancy and has gone far since that time. The rapid growth of any new endeavor should prove to everyone that a real need is being satisfied. A large increase in output is in itself not proof of saturation of the market. If the number of automobiles in 1930 were compared with that for 1910, the increase would be millions of per cent in twenty years but that proves nothing except that the standard of living has risen. Would it be in order to limit production of automobiles even though it made them more valuable or more exclusive? The growth of engineering schools should be gratifying rather than disturbing, although the compensation offered graduates is deplorable.

Figures for the growth of the medical profession analogous to those mentioned above must not be used as criteria for engineering. The doctor offers the community a service mainly personal and individual. Such service calls for some correlation between the number of doctors and the population. Further, as the science of medicine improves and the standards of living rise, the general health of the community is bettered and the individual needs for doctors are less urgent. The situation is decidedly different in the engineering profession. As engineering science advances and the standards of living improve, the need for the engineer rapidly increases, even if only to service and maintain in operation the enormous industries and utilities he has created and must expand. If comparisons are in order, especially between 1890 and 1930, compare those dates in the production and use of electric lights, of telephones, of automobiles, of radios, of refrigerators, and of aeroplanes. Consider also the increased consumption of fuel and power and the enlarged requirements for rubber, steel, special alloys, and the like. Include also the advances in chemical industry. The 1890-1930 comparison is gratifying, to say the least. Should not the engineer be proud of his accomplishments? But he must remember that it requires engineering of a sort to keep these contributions to civilization functioning. Is he sure that a fifty-fold or even a hundred-fold increase in the number of engineering graduates during the past forty years is any too much?

What is the solution to a situation where industry requires a relatively large number of men of mediocre talent which it will uniformly employ in its service branches, while it uses only a small number of highly trained engineers which it would be prepared to compensate handsomely? If the engineering profession, through its engineering societies and their agency, the Engineers' Council for Professional Development, attempted to restrict the number of accepted engineering schools and their enrollments, no doubt it would bring about some greater compensation to individuals. If industry and the community did not rebel and, by sheer economic pressure, wreck the accrediting and restraining procedures, it would still not be a fair solution to the problem. As long as industry requires a large and continuous supply of recruits for its service operations, that demand must be satisfied. Nor would it be fair to the youth of the nation who are engineering minded, though perhaps not brilliant, and who are content to fill the more menial and lower paid positions supplementing the engineering profession. In its desire to glorify the title Engineer, and to advance its own status in the community, the profession must take care not to overstep itself.

Above all, through emergencies and through depressions, the engineer has kept his head, has used his common sense, and has applied the "engineering approach" to all his problems. He must also do so in this instance when considering the improvement of his own status and the restrictions he wishes to place on the youth asking for a place at the bottom of the engineering profession. Especially to the engineer, statistics must not be permitted to lie. He must not confuse the large number of service men required by industry with the relatively few that gravitate by natural selection into the truly professional fields.

Engineering Education of Tomorrow

If the accrediting of schools cannot be carried to the point of materially decreasing, as well as improving, the numbers of graduates from engineering schools, and if a policy of limiting school enrollment is neither practical nor desirable, what then is the solution? Is it not logical that, if large numbers of graduates are necessary for servicing industry, they need not be trained in the more advanced fields of enginering which only a few enter? For really professional engineering, more scientific and technical training would then be required in a post-graduate course. In Chemical Engineering, the latest addition among the departments of engineering, and the one probably least bound by tradition, the handwriting on the wall is evident. Here, the proportion of post-graduate students in the universities is very large compared to that in other departments of engineering, and the industries seek or actually demand doctor's degrees for their better positions, while the regular graduates are employed in the purely service branches. This practice will no doubt become the controlling factor in modeling chemical engineering curricula. Sooner or later, the same practice must become dominant in the other branches of engineering.

The rate of evolution in engineering education and training will be governed largely by industry which employs the graduates. Until industry indicates its demand for more elaborate training of men for its key positions, neither the schools nor the professional societies dare attempt to change the educational system materially. Any drastic action which negates the inertia of the present system is doomed to failure. Those schools which have tried apparently desirable and real departures in engineering education have merely placed themselves in an embarrassing position. Nevertheless, a definite if slow change is surely in sight.

The engineering school of tomorrow will no doubt continue to offer a standard length collegiate course leading to a bachelor's degree. The course will carefully cover the fundamentals of mathematics, mechanics, physics and chemistry with some consideration shown to their more general applications. The course will be directed toward a general grounding in the physical sciences with training in the "engineering approach" to problems. The differentiation between branches of engineering, if not absent, will be less prominent than it is today. Specialization will be avoided, and even the more advanced aspects of the sciences will be neglected. The education in engineering fundamentals will match the capacity of the average student whereas at present some of his curriculum is beyond his grasp. The training will be adequate to satisfy industry for its service operations, to which the majority of graduates will be assigned. In place of the more specialized and advanced subjects dropped, there will appear general courses in English, sociology, economics, finance, government, and the like, all in an attempt to liberalize the graduate's education and better fit him for community life or for entering into the solution of social problems for which some engineering training seems so desirable. The recent scientific and engineering developments have so complicated civilization and so disorganized present social systems that the engineer must sooner or later take a hand in some logical solution of the difficulties. He, above all, should have some idea of "what it's all about".

The bachelor's degree course as outlined above will be no more restrictive in its entrance or graduation requirements than is the present day schooling. Industry will generally absorb all the graduates and will accord them the same privileges at present granted to the output of engineering schools. Their duties will still lie in the field of service for the engineering profession but their education will have been less advanced. More time will have been spent on humanistic subjects and the graduate will be more educated though less specialized.

In the administration of this fundamental course, the cooperative schools will play an increasingly important role. In the cooperative system of education, the student attends school and works on an industrial job during alternating periods throughout the year, while his "alternate" takes his place in school and on the job during the opposite periods. In the best schools, the cooperative engineering curriculum is of five years duration with the first year or two non-cooperative, thus totaling over thirty months of school attendance as compared to the four nine-month years in the standard schools. However, the weekly schedule of studies may be made much heavier for a student when alternating his periods in school if those periods are not too long. As a result, one large and recognized cooperative engineering school requires for graduation more total clock hours (not weeks or credits) of laboratory and class room academic work than any other school in the country. Statements by the uninformed that a cooperative course is a 50% education are obviously, perhaps maliciously, false.

The cooperative course, while not detracting frm the school curriculum, gives the student experience in working for a living in some branch of industry. The academic value of the work is not an essential point. The student learns to obey orders and punch time clocks, loses his antipathy for overalls and unpleasant jobs, realizes what a small cog he is in the industrial machine and how important practical experience may be. In general, he gains a sense of responsibility and a maturity obtainable in no other way. This discipline of the body and soul is a necessary asset to the young man graduating into industry, especially into its service branches. Lack of this discipline has been a definite drawback to the ordinary graduate and is commonly noted by industrial employers. Proof of the need for the cooperative system of engineering training lies in the rapid installation and development of cooperative curricula in so many schools. It has even been undertaken in modified form in the graduate schools of some outstanding institutions. As the cooperative system is coming to the fore now, it will become dominant when the undergraduate course in engineering becomes primarily a preparation for the service branches of industry.

For really professional work or creative engineering, industry will insist on post-graduate training at the universities, probably a three-year course leading to a doctorate, perhaps Doctor of Engineering, which is at present mainly and honorary degree. Here the training will cover the more advanced and specialized phases of the chosen branch of engineering, including the subjects dropped from the undergraduate curriculum. The schooling will be rigorous, definitely organized, and the enrollment will be restricted to those who have shown the proper proficiency in their undergraduate schooling. An accrediting procedure for this phase of engineering training will be a powerful tool. The program for graduate training and its administration should be as different from that in effect for Ph. D.'s as the engineering curriculum differs from that for liberal arts students (hence the suggestion that the degree should be different). The engineering doctorate degree will be the result of seven years' training. The bachelor's degree course, with its fundamentals and its humanistic studies will have been but preparatory to the truly professional education of the engineer, rather than final as at present.

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Governor Raymond E. Baldwin Of Connecticut, Honor Guest

At Sixth Annual Congress of Connecticut Society of Professional Engineers

As announced on the inside back cover of our January issue, His Excellency, Governor Raymond E. Baldwin of Connecticut, was the guest of honor at the Sixth Annual Congress of the Connecticut Society of Professional Engineers in Hartford, on January 27, 1939.

The Congress was arranged through the efforts of Engr. Harry E. Harris, National Director and Chairman of the State Legislature Committee, at whose invitation Governor Baldwin consented to speak, Engr. Carl Gotthardt, Chairman of the State Membership Committee, and the officers and members of the Hartford County Chapter.

Attending the Congress were not only leading registered engineers and land surveyors from all over the State, but representatives of the State Board of Registration, the Water Commission, the State General Assembly or Legislature, the Association of Power Engineers and of the National, State and Local Technical groups. It was a large, enthusiastic and friendly meeting.

The Governor was greeted with deafening applause and his very vital thirty minute address (broadcast over the Columbia Broadcasting System, Station WDRC,—printed elsewhere in this issue) was interrupted by spontaneous applause a number of times. He evinced a thorough evaluation of the particular and various functions of the engineer, unusual in a layman, and specifically asked the help and advice of the engineers in such matters as Public Safety, Automobile Inspection and Flood Control. Through his understanding he undoubtedly won the hearts and goodwill of his hearers. The Connecticut Society of Professional Engineers will give him their wholehearted cooperation in all these matters.

Chairman Engr. Gotthardt followed with a brief speech of appreciation on behalf of the Society to the Governor.

Introductions of notables present from among the profession were then made by Engr. Gotthardt with brief responses.

President Engr. Allan Hubbard then presented certificates to a number of new members with a short but stirring talk upon the aims and ethics of the Society to which they were being admitted.

Prof. John C. Riedel, Vice President of the National Society of Professional Engineers, Past President of the New York State Society and Chairman of the N.S.P.E. Model Law Committee then gave a most interesting forty-five minute address starting with a discourse on model registration laws and emphasizing that such laws were "necessary to safeguard the interests of the public and to preserve life" and finishing with an outline of the history of the profession and a graciously put compliment to the distinguished guest, Governor Baldwin. Engineer Riedel was in his usual good form and his talk aroused great interest. The Governor was one of his enrapt listeners.

This was followed by an open Forum at which suggestions, resolutions and proposals, submitted by individual engineers from around the state on various legislative matters which they considered as affecting or of interest to the profession. Engr. Harry E. Harris, Chairman of the State Legislative Committee presided as Moderator during the open discussion. These thirty proposals that were received, some of them diametrically opposed, were in no way sponsored or recommended by the Society nor by its

Governor Raymond E. Baldwin

Committees but were merely submitted at the Forum for orderly discussion and to ascertain the general sense of the meeting regarding them. The Publicity Committee, Engr. R. C. Lipps, Chairman, prepared multiple copies that were placed on every table so that all could peruse them beforehand.

There was a unanimous and enthusiastic vote given to support Governor Baldwin's economy program. A preponderant voice in favor of maintaining the present type of organization of the Engineering Examining Board and against consolidating it with 21 other vocational and professional licensing boards in a state bureau under a single executive secretary.

The meeting favored asking the Governor to appoint professional engineers on the State Water Commission and requesting the General Assembly to amend the statutes to provide for this as a requirement. There was an affirmative on a proposal that a modification should be requested in the Senate Bill amending the merit system, to include specific rules for selection of qualified professional engineers and land surveyors.

There was no negative vote on a proposal that the State

of Connecticut should only employ legally registered engineers in all responsible and executive positions and on all work requiring any degree of engineering knowledge and experience.

There was a unanimous response to the request to support a bill to license engine and power plant operators, provided that they did not use the term "engineer" in any way including such terms as "power engineer," "stationary engineer" or "operating engineer."

It was unanimous that the Legislative Committee should oppose any bill that would deny professional engineers the privileges that they now enjoy in the writing of documents of a legal nature pertaining to their work.

As the time had run over, Engineer Harris stated that unless some one present wished specially to discuss any of the eight or nine undiscussed matters that he would ask for a vote to refer them to the Society's Legislative Committee for study and action. It was so voted and the Congress was adjourned by Chairman Engr. Gotthardt.

One of the most important matters thus referred to the Committee without discussion were two resolutions, one to protect Professional Engineers against coercion by an amendment to the so-called Wagner Act of the last U. S. Congress and the other to protect the individual rights of Profesional Engineers and Land Surveyors under a State Labor Relations Act patterned after the Federal Act, if it should be passed.

A meeting of the entire Legislative Committee was called for Tuesday, Jan. 31st in New Haven to break down and coordinate the thirty items and assign work for immediate action to sub-committees, to carry out the mandates given at the Congress.

Moderator Harris is to be commended upon the masterly way that he handled a difficult situation within a narrowly limited time without undue delay and ruled out extraneous and unimportant trivialties and yet allowed impartial and fullest discussion of the actual subjects.

Chairman Gotthardt is to be complimented not only for his skillful management and timing of the whole Congress, but upon the recent chartering of two new Chapters, the Waterbury and the Hartford County, and an influx of new members during the short time that he has been chairman of the Membership Committee.

Engr. Henri B. van Zelm and his associates in the new Hartford County Chapter deserve the highest praise for all the arrangements whereby this very successful Congress was smoothly carried on.

"CONNECTICUT CORRESPONDENT"

Address of the Honorable Raymond E. Baldwin Governor of the State of Connecticut

Broadcast by Station WDRC, Hartford, Connecticut

Mr. President, Ladies and Gentlemen—

Connecticut has set its feet on the hard road back uphill to Recovery.

It is an engineering problem.

The true power of the American people lies within themselves. Their ability to cope with problems such as have dogged us, now for almost ten years, lies in organizations such as the Connecticut Society of Professional Engineers.

You are the brains—the specialized brains—of America. If I can persuade you to turn your thought—your efforts—more fully to the problems that confront our State and Nation, my time here with you tonight will have indeed been well spent.

The time is past for us to look to Government for all things. Government can not support us. "God helps them that help themselves," and Government is not more powerful than God.

In talking here tonight, I am assuming that to no group of American citizens can I talk more realistically than to a group of professional men—engineers especially.

You are trained to face facts as they are. You are trained to avoid wishful thinking.

No class in America has suffered more heavily, these past ten years, than has the professional class. And yet, I hesitate to make that statement—not that it is not true, but because I dislike heartily, that word "class."

There is no room for "class" spirit in America. We are all one people. "Class" distinctions, racial and group and religious discriminations, are foreign to our American Way.

To each of us is given some particular, God-given ability. It has been the glory of our American Way that we have given, to each man, the opportunities to which his particular abilities entitle him.

It is the function of Government to keep those opportunities within the reach of everyone, and to guard them against selfishness and greed.

As professional men—engineers—I want you to appreciate the problems that confront us—that confront, us, the people, of this State—of this Nation—of this World.

Dr. Steinman has said—

"The Engineer bends the forces of nature to the uses of mankind."

Today, in dealing with the problems that confront us, we are faced with the greatest of all of the forces of nature—HUMAN nature.

There lies our greatest of all engineering problems.

The world—America—the State of Connecticut—today faces a choice between engineering principles—the principle of brute force—the principle of (shall we say?) modern, intelligent, industrial and political democracy.

Five thousand years ago, there was performed one of the greatest engineering feats man ever has achieved. Thousands and tens of thousands of slaves were driven under cracking whips—labored and gasped and died—to build one of the wonders of the world—the Pyramids.

May I point to you that they—those slaves—had "employment"—of a sort?

But let me ask you this—you, as engineers:

Suppose it were incumbent upon you, today, to duplicate that feat of engineering? Suppose you were called upon to build a second Great Pyramid, here, in America, today? Would you resort to the engineering principles—primative man-power—the brute force—of fifty centuries ago?

Yet that, exactly, is what the world today is doing.

I am afraid the world needs the services of competent engineers. Because, it seems to me, this Great Pyramid that we are being urged to build today not only is topsy-turvy as to building methods employed, but as to design.

It is an inverted pyramid.

Someone turned the blue-prints upside down.

It threatens to topple over and crush the lot of us.

We stand today in the shadow of this inverted pyramid. We look upward, and we can not see the sun, nor the sky, nor the stars. Only this huge structure, looming above us —slanting upward and outward.

We are assured—solemnly—frantically—that its apex is buried safely—rooted deep—in the ground.

That its structural features are such the base will support the mass.

That it will not fall.

Can we believe that? Heaven knows, we'd like to! But, as I prefaced my remarks by saying, you are trained men—you are men trained to face facts as they are—you are men trained to avoid wishful thinking.

I ask you simply, as trained engineers, is it possible to build an inverted pyramid—build, and go on building, upward and outward indefinitely—and maintain its state of stable equilibrium—and not some day have the whole thing collapse?

Here in Connecticut, we are calling a halt. We are getting out from under. We do not believe that an inverted pyramid of civilization can be supported and extended in any direction indefinitely on the slender apex of Government, no matter how deeply rooted.

We are going to turn the blue-prints right side up again. When we do so, we see the broad base of our pyramid clearly outlined. The specifications, instead of an upside-down jumble of hieroglyphics, are clearly readable.

The primary set of those specifications was presented to the General Assembly a week ago today in recommendations for a balanced budget. It is my firm conviction that the way to Recovery lies through the people—the working-people, the business men and the professional men—of this State and Nation.

Government can not put people back to work. That is the province, solely, of business and industry—unless Government intends to take over all employment. Then we should no longer be living in a free democracy, but in a totalitarian State.

If Government is compelled to find employment for an ever-increasing number of people, we must ultimately lose our democracy. Because Government, in order to take care of any number of unemployed, on any permanent basis, must find employment for them. To do that, Government must, increasingly, enter the fields of private business and industry that give people employment.

Thus Government enters into direct competition with its own business men and industrialists and professional men.

Business, and industry, and the professions, which must abide by the rules laid down by Government, can not compete with Government, which makes its own rules. To you, as professional men, all this should have an especially significant meaning.

You, I think, above all others, probably are best in a position to understand what we are trying to do when we say that the cure for unemployment lies with business and industry.

Business and industry must put people back to work. Government's part is, not to provide employment, but to provide a helping hand—a helping hand to the needy, yes—but, constructively, a helping hand to business and industry, so that the wheels may begin turning again, and jobs result, and the number of needy persons be decreased.

There is no substitute for a good job!

Here in Connecticut, our whole legislative and administrative program is geared to this theory. There is no easy road to Recovery. There is no scheme that will bring it next week. Recovery depends upon the revival of business confidence, and there can be no such revival when business-men, large and small, are badgered and harassed by government.

Government must in all things be a friendly, helpful, cooperating force—not an officious, meddlesome policeman.

It is our hope that Business and Industry, and the Professions, with a friendly government here in Connecticut, will take heart. Business and Industry and the Professions can take heart when Government is run according to business principles—when reason prevails, and good engineering is practiced.

The first rule of good business—the first principle of sound engineering, in government or anything else, is a balanced budget.

Some of you may not agree with some of the items contained in the recommendations for a balanced budget that are now before the General Assembly. That is as it should be. Thank God this still is America, where one man's opinion is entitled to as much consideration as another's, and no one man's—or one group of men's—will prevail.

Some of you may not agree with some of the items—but all of us, I think, can agree on the principle of the thing.

Government should live within its means. Additional tax burdens upon the people—upon all of us—should be avoided. If we have to go without some things, temporarily—things that are not absolute essentials or necessities, it is worth it.

As engineers accustomed to dealing with cold facts and figures, I want to say this to you:

The absolute sum-total of the money the General Fund of the State will receive these next two years, without imposition of additional taxes, is, in round numbers, forty-eight million six hundred and forty thousand dollars.

That's all there is—there isn't any more.

Unless new, or additional taxes are imposed on the people—on working people, on Business, on Industry, on Professional people. There you have it—the whole story. If we are to live within our means, we must not spend more than forty-eight million six hundred and forty thousand dollars out of the General Fund.

We must keep our general expenses of State government within that amount. It is exactly as it would be if you were given a budget of forty-eight million six hundred and forty thousand dollars for an engineering project.

True, if you ran over that amount, you might persuade your employer that additional expenditures were advisable. You might succeed in getting more money from your employer.

Unfortunately, the parallel ends there. You would have to persuade your employer to let you run over your budget. The State—unfortunately, I say again—is able, simply, to take the money away from its citizens, in taxes, if it decides to run over its budget.

That is what has been going on—and that is one of the primary reasons for the fear that is hamstringing recovery.

Business can not take heart. Business can not face the future with any confidence—so long as Government operates on the theory that increased taxes may be imposed at any time to make up a budget deficit, and it doesn't matter how much Government spends.

Government, after all, is merely a service—FOR the people—paid for BY the people.

The people have the unalienable right to say WHAT services they want, and HOW they want it performed.

Government is simply the people's hired help.

The people of this State already are paying forty-eight million six hundred and forty thousand dollars into the General Fund for this service. The Highway Fund, of course, is additional and amounts to some forty million, two hundred thousand dollars. Do they want to pay more? That is the whole question—the only question.

For forty-eight million six hundred and forty thousand dollars, these next two years, the State can perform the services expected of it adequately.

There will have to be retrenchment—strict attention to economy. Some services, not absolutely essential or necessary to the well-being of our people, will have to be curtailed, or consolidated with others for greater efficiency, or abandoned, at least temporarily.

On the other hand, this is definite—

No essential State service will be curtailed. No necessary State institution will be closed.

The question is, then, simply: Do you want that? Or do you prefer to pay more taxes? Is it worth going with-

out a few things new, economizing a bit now—so that Business confidence may be restored and all of us (or a great many of us) can go back to work?

Or do we propose to go on spending more and more, without regard for what it does to us and to our State and to our Nation in the long run?

There is a vast field for professional engineering in Government. We need our professional engineers in every phase of governmental activity.

Flood control, the functioning of our highways, highway building and maintenance, and highway safety—these are the obvious things of which the public thinks when engineering is mentioned in connection with the State.

But there are those of you, too, whose fields, I know, ascend into the realms, almost, of pure science. Yours, too, is a shining white light—(or should I say an x-ray?) —that should be turned to advantage, upon the processes of government.

We need scientific, factual appraisal of the problems of government, entirely and completely divorced from wishful thinking.

The multiplicity of problems that confronts us is staggering. There are innumerable ways in which you, both as individuals and as a Society, can help make government in Connecticut better—more efficient—if you will.

Here, for example, is the recommendation contained in my inaugural message to the General Assembly—

"The law providing for the periodic inspection of motor vehicles should be repealed. Its effectiveness in reducing the number of automobile accidents by reason of defective vehicles or otherwise has not been demonstrated. It does not warrant the additional expense placed upon the motor vehicle owner to maintain it."

What is your opinion?

If the Connecticut Society of Professional Engineers has a Safety Committee, it could render the State, and the people of the State, a valuable service by a study of this problem.

Here, too, is the problem of highway lighting.

It is my opinion that the adequate lighting of our highways, especially at dangerous intersections, is the next great forward step our highway system should take.

What do professional engineers—the men who know—say to that? Not only I and the members of the General Assembly would like to know, but the people of this State, and of the country at large, unquestionably would appreciate your considered, scientific opinion.

Flood control!

Following the floods of 1935, the Connecticut Society of Professional Engineers performed a great public service in the Second Annual Connecticut Engineering Congress, at which the main topic discussed was flood control in all its different phases.

The resolution that was passed at the convention for flood control measures won recognition throughout the country—finally found its way into flood control measures in Congress.

It is unfortunate that other considerations now have entered into the flood control picture. You could render no greater service to the State, and to the Nation at large, at this time, than to clarify, once and for all, the actual, cold facts as to the engineering problems involved—what really is necessary, what should be done, and how.

Flood control is an extensive problem, extending far back from actual flood areas. The implications are enormous. To obtain a practical and scientific answer to the problem requires the cooperation of professional engineers of practically every classification.

We seek your support. We need your support. In the legislature are representatives whom you have elected to office. They are your servants. You give them your orders.

Write to the representative from your area. Give him your suggestions. Let him have the practical scientific theories of engineers—who make a business of practical science.

Our concern is giving you an ideal administration. Your concern is demanding that ideal administration. Let us bring the weapons and facilities we have at hand closer together. Let us fight together in the common war to bring recovery.

Engineers have found themselves in a position, these past ten years, not unlike that of government.

It was government's duty to encourage Business and Industry—to support Business and Industry in removing the shroud of Fear. But government could only suggest and encourage. Government could not, should not, attempt to enter directly into the fields of Business and Industry.

Engineers can not apply themselves until there is a desire on the part of Business and Industry for a job to be done.

Then engineers go about forming the link between business and labor—organizing, planning and directing labor in carrying out the wishes of Business and Industry.

Government stands at the intermediary between Business and Industry and labor. It should encourage Business and Industry to put labor to work. It should relieve the grip of Fear.

Engineers plan and suggest for Business. They bring Business and labor together—working hand in hand.

Such is the primary function of Government in times like these.

Pyramids are built with a stout base. That is one of the simplest theories of engineering. That is the principle to which we—in this State—adhere.

Government would do well to borrow a few more theories from engineers—tested and found not wanting.

RESOLUTION

Passed at Connecticut Congress

"Whereas, Governor Raymond E. Baldwin, in his address to the Professional Engineers at their Sixth Annual Congress in Hartford, proposed a Safety Committee of the Connecticut Society of Professional Engineers that could render to the State and the people of the State a valuable service in studying such public engineering problems as highway building and maintenance, highway lighting and safety, motor car inspection, flood control, etc., and supply the Governor and the General Assembly considered opinions to fill the needs of impartial scientific and factual appraisal of the engineering aspects of the problems of government.

"Whereas, Governor Baldwin directly asked for the opinion of the Professional Engineers upon the recommendation contained in his message to the General Assembly that 'the law providing for the periodic inspection of motor vehicles should be repealed.' Its effectiveness in reducing the number of automobile accidents by reason of defective vehicles or otherwise has not been demonstrated. It does not warrant the additional expense placed upon the motor vehicle owner to maintain it.

"Whereas, he specifically asked for the support and cooperation of the Professional Engineers of practically all branches of the profession,

"Be it resolved that the President and Board of Directors of the Connecticut Society of Professional Engineers is hereby asked to appoint a 'Professional Engineers' Committee on Public Safety,' with a personnel of experts of the various specialties, including those versed in automotive, mechanical, highway, illumination, power, sanita-

(Continued on page 13)

WHO'S WHO IN THE ENGINEERING PROFESSION

Editor's Note: Please send in articles of interest regarding members of YOUR chapter for this page.

ELMER C. LAWTON

Elmer C. Lawton was born at Lawtons, N. Y. Educated at University of Michigan, where he was made a member of the honorary fraternities, Sigma XI and Tau Beta Pi and obtained his C. E. Degree in 1907. The same year he was appointed Assistant Engineer in the Department of the State Engineer, New York, in charge of important Barge Canal Projects until 1910, when he became Engineer for the Lackawanna Steel Corporation.

Returning to the Service of the State as an Assistant Engineer in 1912, he engaged on design, construction and maintenance of highways until 1917, when he resigned to accept a position with the Federal Bureau of Public Roads in charge of review of highway plans submitted by various States, as well as field inspection of such work.

He returned to New York State Highway Engineering in 1921, as County Assistant Engineer. He remained until 1923, when he was again employed by Federal Bureau of Public Roads as Consultant, in connection with the State systems, standards of construction, etc.

In 1924, he returned to the New York State Highways in Buffalo Office and was in charge of Maintenance and Construction in Buffalo District and thereafter was made Grade Crossing Engineer for the Department.

In 1931, he was advanced to Deputy Commissioner of Highways in charge of Construction, which position he now occupies.

Engineer Lawton is recognized from coast to coast as one of the best informed and most progressive authorities on highway design and construction. He has spoken before Highway Officials in many States on this subject and is the author of many papers on Highway Engineering.

As Director of Albany Chapter and as Zone Director of the Northeastern Counties of the New York State Society, his unstinted efforts in behalf of engineering progress and association has been outstanding. Endowed with a most pleasing personality and the happy gift of really gracing a professional gathering, he has been very largely responsible for many of the pleasant and enthusiastic Chapter and Zone Meetings of the Northeastern New York area. He has been largely influential also in advancing progressive thought and legislation in the interests of engineering. Engineer Lawton is one of the New York State Society's big assets and we trust that we will continue to retain him for a long time to come.

Governor Raymond E. Baldwin

(Continued from page 12)

tion and other problems having to do with public safety and health.

"And be it further resolved, that a sub-committee of qualified expert professional engineers be formed for immediate study to make a prompt report to the Governor on the law and procedure now in effect on the periodic inspection of motor vehicles."

Respectfully submitted,
HARRY E. HARRIS, *Chairman*
Legislative Committee

Patents and the Engineer

By **Engr. L. Davidson**

Chairman Committee on Patents, New York State Society of Professional Engineers, Inc.

The Engineer is either an inventor or a potential inventor. In the practice of engineering, patented products are used or can be used. Therefore the Engineer is or should be deeply interested in the subject of patents and their legal ramifications.

However, if as Engineers, we could only plead our own selfish interests in patents our position would indeed be based on rather narrow grounds. But, our position is that a patent is a public benefaction and that the inventor only obtains a temporary exclusive right to his invention as a reward for making known a new discovery.

This position is a basic principle of the law of our land and is included in our constitution in the following words:

> "Congress shall have power to promote the progress of science and useful arts, by securing for limited times to Authors and Inventors the exclusive rights to their respective writings and discoveries."

Very few of us are so situated financially that we can afford to spend considerable time and money for experimental work, etc., just to satisfy our vanity for inventors' glory. The main incentive to risk time and money is the assumption that we will have exclusive right to our invention for a limited time in return for publicly making known the why and wherefore of our inventions.

Laws have been so framed and interpreted by the courts that they operate to defeat the constitutional rights of the inventor. As a consequence, the patent gives you "Exclusive rights" and you cannot get to court to protect these rights when unscrupulous corporations raise the question of court jurisdiction, unless you are amply supplied with money and time.

Newspapers are giving much space to the question of patents and some have even ventured to give thought to the advisability of discontinuing patents because of alleged patent monopoly abuses.

There is ample evidence available indicating there is much room for improvement in our patent system and laws, though, I believe correction lies mainly in amending or repealing our laws. Basically the patent system is probably the best there is, and is being discredited by our laws. Undoubtedly new laws are also required to bring our system to function properly and along modern lines to meet existing conditions.

Take away the protection of the "exclusive right" and who will invest their time and money on research and invention? Surely not the individual, and most likely not the corporation.

The main point is, can our country continue to grow for a more abundant life without patents than with them? To me the question is one sided, as I feel our country is now most vitally in need of new inventions to stimulate our commercial life. Also the need to be ready to meet any challenge and defend our country's very existence against foreign design is an Engineer-Inventors problem more than the Statesman's job.

However, some quarters would like to see the further weakening of our laws so that the individual inventor's position becomes less tenable. The important point to consider is whether Engineers and Inventors are willing to be deprived of their constitutional rights, which in effect will be equivalent to saying that only organized research laboratories and corporations are to be the main source of our future inventions, and Individuals, Engineers-Inventors should abandon this field.

Such a situation would be most unhealthy from a national point of view as well as from the people's point of view. With such prospects, how can we honestly encourage our children to study engineering and the sciences, knowing that private engineering practice, often discouraged by other sources, would be on its way out as it must be if we are deprived of our constitutional rights to individual practice and invention. Yet, this is what we are headed for unless Engineers and Inventors are ready to meet the present challenge.

Substantial evidence exists that points to efforts directed to narrowing the field for the individual Engineer practitioner, and curtailing the inventive urge directly or indirectly, is only further evidence that the Engineers must unite to protect their individual professional status, and must also fight for their deserved public recognition through correcting existing laws and fostering new legislation to the end that the Engineer may continue his necessary public service.

It must be remembered that the Engineer who invents successfully not only creates for public use and consumption, but thereby also creates new jobs and removes himself from competing with his fellow engineers along the more formal lines of work.

We often find research laboratories and corporations given much publicity for bringing out new products when actually they improved the invention of an individual who was most likely bought out with a small sum of money and who gets no recognition for his invention.

It should not be assumed that I am against corporations. On the contrary, I believe very large corporations are a necessary and vital part of our form of civilization, and small corporations and the individual too, have their business place in our set up of things. But, our laws must be corrected so that the large corporation run by unscrupulous management is not permitted to use its large corporate resources to defeat the ends of justice. Such questionable business methods operates to discourage individual invention, and in turn is against public policy.

This menace is real, and unless we organize and enlist support, we, and our children and our children's children, will lose a most valuable constitutional heritage, and our national position as a leading country in the practical science and invention is bound to feel the unfavorable consequences.

Our immediate concern should be the establishment of a patent committee in every chapter, and every state organization should have its committee on patents. Our National Society should have a patent committee. The N. Y. State Society of Professional Engineers has a committee on patents actively working, and a number of our chapters have patent committees.

Our first and immediate concern should be concentrated efforts of every chapter and every State Society to strengthen our patent and patent litigation laws to the end that inventors can have their day in court, instead of being at the mercy of unscrupulous interests who, with the aid of our unfair laws, can run the inventor ragged physically and financially and thereby prevent his case from being heard by our courts.

To this end, and as a start for other and most vital patent changes, the patent Committee of the N. Y. State Society of Professional Engineers is about to have legislation introduced to amend the Patent Litigation Act of March 3, 1911, and every Engineer, every Chapter, and every State Society is urged to act and to write their Congressmen and Senators to vote for this legislation.

All this change means is a fair opportunity for the Inventor in court to try his case, so he cannot be run ragged by crooked interests.

It will mean that patents will have more commercial value, will encourage capital to invest in the development of patents and the starting of new industrial enterprises based on patents, and the Engineer-Inventor will stand a better chance to get something for his efforts.

Our committee feels the urgent need for this change and is asking for cooperation and aid.

A Recognizable Profession

New York Times, February 1, 1939—" . . . George M. Spector, an *insurance engineer,* refused to answer questions before the grand jury . . ."

The profession is judged by those who appropriate its designation.

We have made real progress in correcting the misappropriation of our professional designation, but the hurdles still ahead of us are the most difficult. Our efforts are thwarted not only by those outside of the profession but also by some within the profession. They say we are trying to make Engineering a "closed" profession. We say we are trying to make Engineering a "defined" profession. All are agreed on the desirability of a *"defined,* integrated, and unified" profession, so that, in the case of any individual, the public, the profession, and the man himself will know whether he is or is not an Engineer. Registration is the only method of accomplishing this objective. Legal protection of our professional designation is a necessary concomitant.

Before a profession can expect recognition, it must be recognizable.

DO YOU KNOW...

Pertinent Facts Concerning the Professions

4. ACCOUNTING

***By* Engr. D. B. STEINMAN, Past President N.S.P.E.**

Do you know that:

There are 17,000 individuals who have received certificates in one or more States to practice as Certified Public Accountants.

Generally the requirements for C.P.A. are high school education, experience ranging up to 5 years, and passing examinations by the State Board.

4/5ths of the States use the C.P.A. examinations set by the American Institute of Accountants.

The lack of organized formal C.P.A. training has resulted in a consistently large percentage of applicants failing to pass their examinations.

50 percent of all Certified Public Accountants are now members of their State Associations.

The *one* national C.P.A. organization is the American Institute of Accountants (since its merger in 1937 with the American Society of Certified Public Accountants).

The American Institute of Accountants has 5,000 members. (Organized 1916).

Practically 100 percent of the membership of the American Institute of Accountants is of Certified Public Accountants.

New York State has led the way in legislation establishing *educational* requirements for the C.P.A. profession.

In most States, there is no restrictions upon the practice of public accounting as long as the practitioner does not designate himself as a "Certified Public Accountant."

For the C.P.A., it is recognized that *breadth of training* will be increasingly required, rather than specialization, to meet the greater demands of modern business. The C.P.A. is urged o become a lawyer, an economist, and an industrial engineer, as well as an accountant, to meet the growing problems of his practice.

The rapid increase in the number of accountants has dismayed many in the profession who believe that the growth has been more rapid than the demands of business.

In 1896, a group of accountants, upon application, received from the State of New York the right to examine and license qualified persons to practice in the profession under the protected title of "Certified Public Accountants." Other states followed with C.P.A. laws.

The American Institute of Accountants specifies in its constitution: "After January 1, 1936, no applicant shall be admitted as a member (or as an associate) unless he holds a valid and unrevoked C.P.A. certificate issued by the legally constituted authorities of a state or territory of the United States of America or of the District of Columbia."

In 1932, the New York State Society of C.P.A. called on all other state societies and on the two national societies to do something about forming one national society. This desired amalgamation was effectuated in 1937.

All of the states now have laws which limit the use of the designation Certified Public Accountant to those who have been qualified, examined, and certified by a State Board.

40 States and 4 Territories use the examinations prepared by the American Institute of Accountants. The examinations are conducted locally, and the papers are then returned to the Institute for rating.

Less than 16 percent of the candidates are successful in passing the C.P.A. examination at the first trial. After repeated trials (averaging 3 or 4 repetitions) about 56 percent of the candidates finally succeed in passing.

Out of 72 colleges offering courses in accounting, only 39 are now approved. After January 1, 1938, in N. Y. State, an applicant for admission to the accountancy examinations must have completed a course of study approved by the State Education Department,—4 years of day school or 6 years of evening school. In addition, the college graduate is required to have one year's experience in the office of a C.P.A.

No man is recognized as a member of the accounting profession unless and until he has been certified by his State Board.

(Acknowledgment: Data excerpted from a report *Professional Recognition in the Field of Accounting* prepared by A. D. Hinckley for the Committee on Professional Recognition of E. C. P. D.)

National Society Welcomes Delaware as New Members

February 11, 1939

To the National Officers, Directors,
State Presidents and Secretaries:
Gentlemen:

It gives me great pleasure to announce that the Delaware Society of Professional Engineers was organized and received National Society of Professional Engineers State Charter No. 24 from Executive Secretary Willard S. Conlon at the DuPont Hotel, Wilmington, Delaware, Friday evening February 10th.

Let us all congratulate the temporary officers of the Delaware Unit on the occasion of their becoming affiliated with this Society. The officers are:

Temporary *President:* Engr. Russell D. Rogers, 3115 Van Buren Street, Wilmington, Delaware.

Temporary *Secretary:* Engr. Carl C. Stimmel, 221 West 6th Street, Wilmington, Delaware.

Temporary *National Director:* Engr. Harry S. Stanton, 2011 Monroe Street, Wilmington, Delaware.

(Signed) PERRY T. FORD, *President, N.S.P.E.*

Contributions Please!

The Society desires State officers to send to the Editor at Harrisburg, Pennsylvania, all news of State activities of general interest or of special interest to the Society.

We are especially anxious to have the middle west and western State Societies have as prominent a place in the magazine as the eastern State Societies have had.

The western societies are newer and may be reluctant, but we assure them that we will be glad to use all of value they send to us.

We also welcome articles from individual members on professional subjects.

THE EDITOR.

NEWS OF STATE SOCIETIES

Editor's Note: THE AMERICAN ENGINEER will carry reports of State and Chapter meetings in the issue succeeding their receipt. We must have copy by the 20th of the month preceding the month of issue. Copy received after that date runs the risk of not being on time.

DISTRICT OF COLUMBIA

At the annual meeting of our society held January 10, 1939, the following officers were elected:

Engineer Leo H. Cleary, President
Engineer William L. Bach, Vice-President
Engineer L. E. Van Allen, Secretary
Engineer Walter I. Swanton, Treasurer.

The following engineers were elected to the Board of Directors for the ensuing year: Wayne B. Chambers, J. Irvin Ellmann, John W. Simms, M. X. Wilberding, Virgil C. Wagner.

The following were elected supervisors: Engineer Claude R. Engle, Jr., Engineer Milton Kellert, Engineer Col. George D. Leslie.

President Cleary has appointed, and the Board of Directors confirmed, Engineer Virgil C. Wagner as National Director.

L. E. VANALLEN, *Secretary.*

At a meeting of the Board of Directors of this society held on January 24, 1939, the following committees were appointed by the president and approved by the Board of Directors.

Legislative Committee—Engineers L. H. Cleary, Chairman, Walter I. Swanton, M. X. Wilberding, Virgil C. Wagner.

Membership Committee—Engineers Milton Kellert, Chairman, E. M. Meyers, Claude R. Engle, Virgil C. Wagner, J. I. Ellmann, Wayne B. Chambers.

Programme and Meetings Committee—Engineers Col. Geo. D. Leslie, M. C. Steuber, L. E. Van Allen, Stanley G. Simms, Layton B. Newhall.

Publicity Committee—Engineers John W. Dunham, J. I. Ellmann, William Bach.

Employment Committee—Engineer Richard A. Jobes.

J. J. ELLMANN, *Publicity Committee.*

INDIANA

I. S. P. E. NEWS LETTER

Issued by the Indiana Society of Professional Engineers, Inc.

Editor: K. B. Wolfskill Operations Mgr. W. A. Miller
Circ. Mgr. G. L. Knoll

LEGISLATIVE PROGRAM

Chairman Hardy reported on the activities of the legislative committee at the January meeting, outlining the 4 point program proposed for action by the Society. As indicated in the January *News Letter,* bills have been prepared covering a merit system for the engineering service of the Highway Commission and other state departments employing engineers, a change in the increase in pay provided for county surveyors who are also registered professional engineers, and a revision in the schedule of compensation for city engineers in cities of the second to fifth class. Hardy discussed at length the engineering merit bill, outlining its features and proposed operation. Chairman Yater of the City Engineer's Committee reported on the proposed measure to change the salaries of city engineers in second, third and fourth class cities. As now written, maximum and minimum salaries are provided for each class, and the fifth class cities are to choose between a fixed salary or employment on a per diem basis. The bill for county surveyors has also been endorsed by the County Surveyors Association.

The committee expects that these three measures will be introduced at an early date and to secure enough support from the members of the Society, working through their own local representatives, and from other interested groups to obtain action on the bills during the closing weeks of the session. Either at the meeting of February 16th, or by mail, the membership will be advised as to the numbers assigned to the bills, when introduced, and as to the suggested program of contacts to help in securing their passage.

The committee recommends to the members of the Society that they unanimously work *against* the passage of H.B. 309 (Shull, DeKalb County). This measure, introduced in the House last week, and referred to the committee on townships and county business, would provide that all land surveyors registered on July 1, 1939 shall be given a certificate of registration as a professional engineer. The bill, as proposed, tears down the distinction between the professional engineer and the land surveyor as now set out in the law requiring separate registrations and different qualifications. The committee believes that it is inimical to the ideas of Society, and will work against the betterment of the engineer and the securing of the professional recognition which is rightly his. The bill is still in the hands of the house committee, but members are urged to contact their local representatives to prevent its passage.

As a fourth point in its program, the committee has approved the proposed budget increase for the Registration Board, which increase is to be used for an enlarged educational and enforcement program along the lines suggested by the Society. Chairman Boatright of the Committee on Registration Board Contacts reported at the January meeting on the meeting with the budget committee of the Legislature. Several members of the Society attended the meeting and ably presented the case for enforcement and education, using the funds paid in as license fees by the engineers themselves. The budget increase was approved, but is still to be acted upon by the legislature before being included in the appropriation bill.

A resolution favoring the support and passage of H.B. 109, an act to provide for the licensing of water and sewage plant operators of cities in the state was also passed at the January meeting, and members should use their efforts in behalf of this measure, as looking toward the raising of standards in a field allied to that of engineering.

FEBRUARY MEETING

The February meeting of the Society was held on Thursday, February 16th at 7:30 P. M. in the World War Memorial, Indianapolis.

NOMINATING COMMITTEE

The nominating committee for next year's officers, chosen at the January meeting, consists of Engineers Hadley, Henning, Mazur, Mendelhall and Wysong. Since the committee, with Hadley as chairman, is endeavorng to provide the membership with a representative choice of candidates for each of the offices to be filled, it is suggested that the membership at large write W. W. Hadley at the State House Annex, offering the names of men as candidates, or discuss the matter with any of the members of the committee.

The success of the Society over the next year depends in no small measure on the ability and enthusiasm of the officers, and the best possible choices for the offices of President, Vice-Presidents, Secretary, Treasurer, National Director and Directors must be made.

ENGINEER PLACEMENT

One of the least publicized activities of the Society is the handling of engineer placement. The work, carried on rather informally thus far, is being done by the Chapter Affairs Committee, under the Chairmanship of H. Brunsman. Since January 1st, at least 4 engineers, members of the Society, have been placed in new positions as a result of contacts arranged through this activity of the Society.

Because of its makeup and membership, the Society is particularly qualified to render this service to its members, and to other engineers and engineering firms, in securing connections for trained and competent men and locating such men for positions which are available; especially in the civil field. If the other member societies of the Engineering Council would institute such a service to their own members, a comprehensive placement program could be developed, in which the individuals handling the matter for each group could by common action see that the best qualified men available be put in touch with the positions available in the various fields.

LANCET LEAVES WPA

Kenneth Lancet, former Director of the Society, has resigned as Acting Director of the Women's and Professional Division of the Indiana WPA to take the position of Secretary of the Engineering Metal Products Co., of Indianapolis.

ENGINEERING SERVICE CONTINUITY

In the annual convention address to the American Association of State Highway Officials at Dallas in December, President C. H. Purcell, who is State Highway Engineer of California, had the following to say:

"In the imperative need of long range planning, and in the steps and stages involved in orderly planning, radical changes in Highway personnel are detrimental. If we are to attain the high standards of an efficient highway system, continuity in engineering service is a necessity.

"It is essentially a waste of public funds to recruit and train our engineering personnel only to discard it and start over again every few years. An engineering organization, if it is properly formed, becomes to a large extent one of specialists in the problems of that particular state. * * *

"Continuity of service also acts as an incentive to the engineer to put forth his best efforts, since he has some assurance he will be able to finish the work he has started."

GEUPEL RESIGNS

Louis A. Geupel, director of the Society and member of the Registration Board, has resigned as City Engineer of Evansville to become superintendent of the waterworks. He will continue to serve as consulting engineer for the city. Chas. Day has been appointed to the vacant post from that of assistant city engineer.

NEW MEMBERS

The new members of the Society as reported by Chairman Pierce of the Membership Committee at the January meeting, their addresses and field of activity, are:

C. O. Bartelson, Terre Haute, C.E.
R. P. Cordiner, Ft. Wayne, C.E.
C. Lichtensberg, Ft. Wayne, E.E. M.E.
W. E. Roby, Indianapolis, E.E.
I. Van Trump, Chicago, Ill., Chem.
A. Zimmerman, Indianapolis, C.E.
B. P. Melton, Lebanon. (Junior)

The Society now has 503 members and 59 Junior Members.

MARYLAND

Maryland Society of Professional Engineers, Inc.

MINUTES OF MEETING OF JANUARY 6, 1939.

Room R-100, Engineering Bldg., Univ. of Maryland, College Park.

After a few words of welcome by President Gast and the approval of the Minutes of the First Meeting and the Treasurer's Report, Engineer Floyd L. Reed of the American Bitmuls Co., of Baltimore, was accepted as a member transferring from the Ohio Society of Professional Engineers.

Dean Steinberg of the University of Maryland then briefly reviewed the last ten year's development in attempts to secure registration of engineers in Maryland initiating with the Maryland Association of Engineers in 1929 and culminating in the passage of a resolution by its board of directors on December 20, 1938, as follows:

Whereas, at the present time forty states have enacted laws for the registration of professional engineers and land surveyors, including several of the states surrounding Maryland; and

Whereas, an increasingly large number of engineers and land surveyors in Maryland feel the need for such a law in this state in the interest of public health, public property and public safety and to advance the best interests of professional engineering and land surveying in the state; and

Whereas, the Maryland Association of Engineers has since its organization ten years ago been actively in favor of the enactment of a registration law for professional engineers and land surveyors in Maryland, and as evidence thereof has continuously maintained a Committee on Registration; now

Therefore Be It Resolved, that this Association, through its Committee on Registration, prepare a law for the registration of professional engineers and land surveyors in Maryland in cooperation with all groups in the State that are interested in such legislation and take such steps as may be necessary to secure enactment of such a law at the coming session of the Maryland Legislature.

In accordance with this resolution Dean Steinberg as chairman of the Maryland Association's Committee on Registration prepared with his committee a bill which follows closely the Model Law with certain differences approved by the Maryland Association of Engineers, Maryland Section of A.S.C.E. and the Prince George's and Montgomery County Engineers and Surveyors.

Dean Steinberg closed by stating that the best hope of success of getting a bill through the present legislature depended upon close cooperation of all groups of interested engineers in Maryland.

President Gast then called on Engineer Conlon who stated that this new society composed *entirely* of engineers and untrammeled by tradition or dictation if determined energetic, and militant could accomplish many worthwhile things in the State of Maryland. He cited numerous examples of other state societies' phenomenal growth and amazing accomplishments. We should go along with the dean and other organizations in favor of registration, appoint a legislative chairman and review their bill.

Engineer Conlon, when asked about the activity of unions in regard to engineers, particularly sub-professional men, stated that such activities might be counteracted by providing a clause in the contemplated Maryland Registration Law allowing men to take the technical examination as soon as they graduate from college and thus have a sub-professional status and perhaps admit them to membership in Maryland S.P.E. (without vote, or membership in N.S.P.E.) so they would early come under the influence of a professional group and not that of unions.

Enginer Conlon closed by emphasizing the fact that we represent the militant arm of the engineering profession and that a small group, if properly organized lobbyists for engineering and know how, when and where, can accomplish more than larger groups hampered by tradition and conservative dictates. Maryland S.P.E. should attempt to secure members from *all* branches of the profession.

On a motion by Engineer Huckert, seconded by Engineer Nesbit, the present officers were retained for 1939.

Captain Dewitt Clinton Webb was unanimously elected First Vice-President.

It was agreed that the election of the rest of the officers (2d vice-president, national director, and state directors) be deferred until the next meeting.

On the suggestion of Engineer Reed the President appointed Engineer Stubler of Baltimore to the Membership Committee.

Engineers Lindahl, (chairman), Huckert and Creese were appointed as the Audit Committee.

Following the suggestions of several members Engineer Conlon was appointed chairman of Legislative and Enforcement Committee.

It was unanimously carried that Maryland S.P.E. meetings be held on the *first Friday of every month* and that the next meeting be held in the same place, *i.e.*, Engineering Building, University of Maryland, at College Park.

R. B. Allen, *Secretary-Treasurer.*

NEW JERSEY

The February dinner-meeting of Monmouth-Ocean Society of Professional Engineers was held at the Berkeley-Carteret Hotel, Asbury Park, N. J. This meeting was well attended and the interest aroused by the January Convention brought out many new faces. H. H. Johns and his associate of the Texaco Co. presented a very interesting moving picture—"The USE of Asphalt Mixed in Place Road Construction."

Leo K. McKee, *Secretary.*

NEW YORK

Westchester County Chapter
of the
New York State Society of Professional Engineers

CHAPTER NEWS

The February meeting of the Chapter was held Thursday evening, February 2d at 8:15 P. M. at the Y. M. C. A. Building on Main Street, Tarrytown, N. Y. The program committee arranged to have Seth G. Hess, Chief Engineer and Executive Secretary of the Interstate Sanitation Commission give a talk on the subject of the Correcton of Pollution of the Waters in the Metropolitan Area, with particular reference to the conditions of the waters adjacent to Westchester. Special Tarrytown Attendance Committee was under the leadership of Ed. Martin. Others on the committee include Jerry Lawlor, Jim Losee, Bill Van Tassel, Charlie Baulsir, Al DiGiacinto, Howard Barnes, Frank Fowler, C. A. Reiter, and John White.

There were fifty-two in attendance at the Mt. Vernon meeting; 34 members and 18 non-members were included. Among those in attendance were the following: Members Waterbury, Durkee, Stearns, Benline, Brady, Avery, Anderson, Duffy, Vogel, Laverty, Weyant, Krey, Keaveny, Potter, Brainerd, Brienza, Watt, McFall, Shane, Rundell, Doolittle, Imer, Bassett, Currey, Wright, Swazey, Traub, C. R. Cronquist, Chester Cronquist, Loughran, Wenzel, Root, Leach, Reiter, Browne, Hartman, and Sells. Non-members James D. Kent, L. L. Foher, E. Dickee, A. P. Balston, W. Snow, R. B. Durant, N. S. Odell, J. E. Crawford, R. L. Price, W. W. Scott, Jr., E. J. McCormick, Edwin A. Kingsley, E. F. Richardson, and Col. A. Pearson Hoover.

Col. A. Pearson Hoover gave an interesting and inspiring talk on "The Engineer in Politics."

The Chapter endorsed three members for the position of engineer member of the County Planning Commission. Those endorsed were Jim Rundell, Jay Downer and Leslie Holleran.

NOMINATIONS FOR DIRECTORS

In accordance with the Constitution, at least eight members should be nominated for the three year term for Director. The incumbents whose terms expire in April are John Avery, Arthur Benline, F. L. Laverty and John Weyant.

APPLICATIONS FOR MEMBERSHIP

E. H. Carlson, 324 Montross Avenue, Peekskill, N. Y.
Stephen C. Richards, 200 Columbus Avenue, Valhalla, N. Y.
Alexander S. Traub, Jr., 56 Ludlow Street, Yonkers, N. Y.
Octave W. Imer, 22 Hillcrest Avenue, Rye, N. Y.
Walter S. Hood, Yorktown Heights, N. Y.

Five applications for membership have been received in January. This is a creditable start for 1939. A total of 34 new members were added during 1938.

Joe Brady has appointed a Lapsatin Committee to bring backsliders into the fold. Ray Potter is Chairman; John Weyant and John G. McFall will aid and abet him.

A recent issue of the *Mt. Vernon Argus* carried a front page picture of George MacBeth who has been named a director of the Mt. Vernon National Bank. Congratulations, George! We are sure you will do a nice job.

The members of the Water Supply Committee include Jim Duffy, Chairman, Jim Rundell, John Weyant, Jim Losee, and Max Vogel. My apologies to Jim Rundell for the statement at the last meeting when that committee's report was under consideration.

Arthur Benline invited many of those who attended the Mt. Vernon meeting to attend a performance of "Here Come the Clowns." Among those present at the theatre party were Andy Anderson, Bill Wenzel, Charlie Sells, Larry Waterbury, Merritt Durkee, Al Stearns, Joe Brady, Jim Duffy, Max Vogel, Ben Krey and Laverty.

ASSISTANT ATTORNEY GENERAL JEREMIAH F. CROSS ADDRESSES BRONX PROFESSIONAL ENGINEERS

Jeremiah F. Cross, Assistant Attorney General of New York State, 1st Vice-President of Bronx Chamber of Commerce, and former New York State Commander of the American Legion, addressed the Bronx County Chapter of the New York State Society of Professional Engineers, Engineer Rudolph C. Lang, presiding, at their regular monthly meeting February 2, 1939, at Concourse Plaza Hotel, Bronx, New York.

Commander Cross told entertainingly of "An Average Day in a Large Real Estate Office," recounting actual and diverse experiences, both humorous and serious, from a legal angle. He explained points of Law of interest to Engineers and managers of real property.

Commander Cross made a plea for all organizations in the Bronx to get together and work cooperatively for the civic needs of the Borough. He stated that a Community Center is urgently needed for the one and one-half million people of the Bronx and asked that the Professional Engineers work with other organizations to create this Center as a monument to the Bronx and to the Nation.

President Lang assured Commander Cross the Professional Engineers would be glad to cooperate in this civic enterprise.

Engineer Arthur V. Sheridan, Past President of the National Society of Professional Engineers and of the Bronx County Chapter was present at the meeting.

Engineer Philip Conrad Fischer was elected to membership in the society.

Engineer Geo. C. Zamory, Chairman of the Membership Committee suggested the Chapter assist the Juniors and aid them to become Professional Engineers.

Engineer Patrick H. Murray, Chairman Public Work and Improvement Committee, explained the need in the Bronx for additional parking space, particularly in the vicinity of Fordham Road and the Grand Concourse; the need for improvement of street intersections; and for an increase in transit facilities. Engineer Murray's Committee is working on these problems together with that of the Harlem River Drive, and concrete results which will benefit the borough are expected.

On the motion of Engineer Alexander Haring the Chapter gave Engineer Murray and his Committee a vote of thanks for the fine work they are doing and the progress made in solving these problems.

Engineer Walter C. Federlein of the Old Age and Unemployment Committee told of the assistance his committee is giving the Congressional Committee in solving the problem of Old Age and Unemployment. He particularly urged the passage by Congress of Bill H.B. No. 118.

Engineer Edward J. Fitzpatrick, Chairman of the New York World's Fair Committee gave a resume of the work his committee is doing as one of the principal advisers to the Bronx Civic Congress in promoting Bronx Week at the New York World's Fair of 1939.

President Rudolph C. Lang stated that the Professional Engineers are civic minded and are working to further the best interests of the people of the Bronx.

KINGS COUNTY CHAPTER

New York State Society of Professional Engineers, Inc.

The regular meeting of Kings County Chapter of the New York State Society of Professional Engineers, Inc., was held on Thursday evening, February 16, 1939, at the Brooklyn Engineers' Club House, No. 117 Remsen Street, at eight o'clock.

Our increasing attendance is most gratifying to the Officers and Directors and to the members of the Program Committee who have been endeavoring to make our meetings of greater interest and significance to the members.

According to the State Society's latest issue of the Analysis of Membership by County Chapters it is gratifying indeed to note that our Chapter leads the four largest chapters of the Metropolitan Area in the collection of 1938 dues with 86%. Let's strive to stay at the top in the collection of 1939 dues—with a perfect score of 100%—it can be done.

Just as this copy went to press newspaper headlines announced that Professor John Charles Reidel was named Chief City Engineer of this great Metropolitan city, a position formerly held by Engr. Vernon S. Moon. Professor Riedel was a leading figure in our profession before, but now he becomes even more of a luminary. As head of the engineering department of the city and chief engineer of th Board of Estimate Professor Riedel is "The Right Engineer for he Right Job." Professor Riedel is a member of our Advisory Council and past president of the Chapter; a past president of the New York State Society of Professional Engineers; past president of the Municipal Engineers of New York; past president of the Brooklyn Engineers' Club and vice president of the National Society of Professional Engineers.

GEORGE A. DORFMAN, *Secretary.*

OHIO

MAY NOT ADVERTISE ONE'S SELF AS "ENGINEER" UNLESS LICENSED

Opinion No. 6467: (State of Ohio)

"SYLLABUS:

Under the provisions of Section 1083-1, et seq., General Code, a person who has not been duly licensed as a registered professional engineer may not advertise in the state of Ohio that he is a Civil Engineer or make use of some other similar title.

State Board of Registration for

Professional Engineers and Surveyors,
1113 Wyandotte Building,
Columbus, Ohio.

Gentlemen:

This will acknowledge receipt of your request for my opinion which reads in part as follows:

> 'The State Board of Registration for Professional Engineers is desirous of securing an opinion from your department relative to the illegal use of the term 'engineer' as used in various telephone directories by men who are not legally qualified to practice engineering as set out in General Code Sections 1083-1 to 1083-26, inclusive.'

You enclosed a letter from the Cuyahoga County School of Professional Engineers, which reads in part as follows:

> 'Our Board of Direction requested that we obtain through you an opinion from the Attorney General:
>
> 1. If an individual lists himself as a 'Consulting Engineer,' 'Civil Engineer,' 'Sanitary Engineer,' etc., and is not registered in Ohio, can we bring charges against him under Rule XVI just as readily as if he listed himself as 'Consulting Professional Engineer,' 'Civil Professional Engineer,' 'Sanitary Professional Engineer,' etc.'

The Legislature, in 1933 (115 O. L., 335) enacted a comprehensive program for the regulation of professional engineers and surveyors. In 1935, (116 O. L., 174), the Legislature amended this law, but these amendments are not material to your inquiry. Section 1083-1, General Code, is particularly pertinent to your question, and reads as follows: * * *"

"* * * For the purpose of this opinion, I assume that the persons in question are not exempted from the provisions of the law. For such exemptions see Section 1083-20, General Code. An examination of the above quoted Section 1083-1, clearly discloses that what is forbidden to an unlicensed person is not only the actual practice of engineering but also the holding out to the public that one is

a professional engineer. Such a broad aspect concerning these license laws is not unique. See for example, Section 1335-5, General Code. The terms 'Professional Engineer' and 'practice of professional engineering' are defined in Section 1083-2, as follows: * * *"

"* * * Section 1083-23, General Code, which is the penal section of this license law, reads as follows: * * *"

"* * * Legislation similar to this license law has been uniformly upheld as a proper exercise of police power. No doubt the Legislature felt that in the interest of the safety of the general public, not only the actual practice of engineering should be regulated, but also the public should be protected from persons who hold themselves out as engineers. In other words, the public should be protected from the possibility of deception by unlicensed persons. * * *"

"* * * While it is true as stated in the letter addressed to you, that the individuals in question do not use the word 'professional,' it is nevertheless the intent of the person who calls himself for example, 'civil engineer' and inserts his name with such title, in a telephone directory, to convey the impression that he is a 'professional civil engineer.' It is rather difficult to imagine why a person would list himself in a telephone directory as a 'civil engineer' unless he intended to convey the impression that he was a professional engineer and would practice such profession if called upon to do so. In fact, it is an invitation to the public that his professional services are for hire. In any event the language of Section 1083-1 is very broad and it can be safely said that the Legislature intended to prevent anyone conveying the idea that he is a professional engineer unless he is duly licensed as such, under the provisions of Section 1083-1, et seq., General Code. It would seem that the examples mentioned in your letter violate not only the spirit but the letter of the laws as expressed in Section 1083-1, General Code.

It is therefore my opinion in specific answer to your inquiry that, under the provisions of Section 1083-1, et. seq., General Code, a person who has not been duly licensed as a registered professional engineer, may not advertise in the State of Ohio that he is a civil engineer, or make use of some other similar title."

Respectfully,

JOHN W. BRIKER, *Attorney General.*

February first issue of the *Phila. Legal Intelligencer* contains the following news item:

"Cleveland, January 31 (CCNS)—No charter will be issued in Ohio if purpose clauses in articles of incorporation disclose that professional services of any nature, including the practice of law, may be offered, Secretary of State Earl Griffith informed Joseph L. Stern, Chairman of the Ohio State Bar Association's Committee on Unauthorized Practice of Law.

Griffith asked that the bar and the public be advised that his department intends to adhere to the strict enforcement of the following rule:

> "No charter will be issued if the articles of incorporation disclose that any of the purpose clauses included acts which constitute the practice of law or the carrying on of any profession."

"This rule," Griffith said, "will be diligently and faithfully followed in spirit as well as in letter. Corporate names will be scrutinized and charters refused if the names suggest that professional services may be offered."

SAMUEL I. SACKS.

PENNSYLVANIA

THE PITTSBURGH ENGINEER
Issued Monthly by Publications Committee
Martin C. Knabe, Chairman Earl Dwight Covell, Vice Chairman

CALENDAR

Pittsburgh Chapter Meeting: Assembly Room, Fort Pitt Hotel, 8:00 P. M., Thursday, February 16, 1939.
Speaker: F. Hughes Moyer, Pittsburgh Chapter Member.
Subject: "Relation of Engineering to Industry."
Dinner: Fort Pitt Coffee Shop—6:30 P. M.

NEW MEMBERS—MEMBERSHIP STATUS

Three names were added in January, and we gladly welcome
Engineer HEINZ MEINECKE, 224 Catalpa Avenue, South Hills, Pa.

Engineer FRANK H. RECCO, 973 Fifth Ave., New Kensington, Pa.

Engineer ROLLAND GEORGE STURM, Aluminum Research Laboratories, New Kensington, Pennsylvania.
into our chapter.
Total Members: 168 Members Transferred: 0

INTERESTING ITEMS

Thomas J. Mitchell, Assistant Engineer of Tests of Allegheny County, and a member of this chapter, attended a dinner meeting of the Canton Regional Society of Professional Engineers at Canton, Ohio, on January 10th. Engineer Mitchell reports that he was given a cordial welcome, and was introduced to George L. Bliss, President, and W. C. Anderson, Secretary, of the Canton Society.

During the early part of January we received word that the commissioners of South Huntingdon Township, Westmoreland County, had let a contract for survey of a road relocation to a person not registered. Upon our reporting same to the State Board, sending copy of the letter to the commissioners and to the party receiving the contract, we were advised that contract had been taken from the person not registered and given to a registered surveyor.

Engineer Johann Hahn writes that he will be in Berlin, Germany, until May, 1940, in the employ of H. A. Brassert & Company.

ENGINEERS—ARCHITECTS JOINT COMMITTEE MEETING

Engineer Edward J. Ducey, member of the Joint Committee of the Pennsylvania Association of Architects and the Pennsylvania Society of Professional Engineers, attended a meeting of this committee in Harrisburg on February 21, 1939. Engineer Walter H. Frick, also of Pittsburgh, was in Harrisburg at the time, and it was arranged for him to be invited to the meeting. This gave the Pittsburgh Chapter excellent representation; Engineer Ducey, being in the employ of a contractor doing work for both engineers and architects, could speak to both groups very frankly; while Engineer Frick, who is in private practice and thus had contacted architects on numerous occasions, was able to present his views from that angle. Unfortunately, neither of the two Pittsburgh members of the Architects' Committee were able to attend.

It is reported that the spirit of the meeting was excellent, good fellowship and cooperation prevailed, and both groups displayed a real desire to help work out each others problems.

The prime purpose of the meeting was to agree on the proposed revision of the Architects' Registration Law. A revised draft of the act, which had been prepared by the Architects, was referred to a sub-committee consisting of Engineer Sacks and Architect Abel and one or two others to be appointed from the Philadelphia district; the sub-committee can thus meet without excessive traveling. After this sub-committee has re-drafted the act it will be submitted to the committee as a whole and from it to the various chapters of the two societies.

Engineer Robert Hall Craig was present and stated that the Engineers Committee would be reappointed for the coming year to complete this work.

FORMATION OF JOHNSTOWN CHAPTER

Engineers from Cambria, Indiana, Blair, Huntingdon, Somerset, Bedford and Fulton Counties gathered at the Fort Stanwix Hotel in Johnstown on Saturday, January 28th, for the purpose of organizing the Johnstown Chapter of the Pennsylvania Society of Professional Engineers. After the fifty engineers present had dined, Engineer Horace S. Bracken of Johnstown, acting as Temporary Chairman, introduced Engineer Irvin H. Geiger, Past President of the Harrisburg Chapter, as Toastmaster.

The speakers were Engineer Robert Hall Craig, of Harrisburg, Editor of the AMERICAN ENGINEER, University of Pittsburgh. Engineers Craig and Holbrook are President and Vice President of the Pennsylvania Society.

Following the talks, Engineer E. S. Dickey of Johnstown was elected Chairman of the meeting, and Engineer H. S. Bracken, Secretary. The work of organizing the new chapter—the ninth in the State Society—then proceeded, although there was considerable enthusiasm displayed for not one, but two chapters—at Johnstown and Altoona. The final result was the formation of the Johnstown Chapter and an Altoona Chapter deferred until a later date.

For the present, officers were chosen as follows:

President: S. E. Dickey, Johnstown; Vice-President: L. L. Gwin, Altoona; Secretary-Treasurer: Warren H. Hinks, Johnstown; State Director: L. R. Owen, Johnstown; Chapter Directors: A. V. Little, Ebensburg; C. P. Thomas, Johnstown; Herbert B. Moffitt, Indiana; R. W. McCullough, Indiana; B. A. Long, Altoona; Frank M. Hunter, Altoona.

The new chapter starts out with a membership of twenty-seven.

The meeting was sponsored by the Harrisburg and Pittsburgh Chapters. Guests from Harrisburg were Robert Hall Craig, President of the State Society; Irvin H. Geiger, from Pittsburgh; E. A. Holbrook, F. G. Ross, President of the Pittsburgh Chapter, Benjamin H. Aires, Charles A. Finley, David Camilli, Roswell Canfield, John M. Duff, Charles N. Carten, George T. Schusler, Carl W. Hagberg and J. A. Graft. Also present was Joseph Stastny of Greenville, Secretary-Treasurer of the Mid-Western Pennsylvania Chapter.

Telegrams were received from Alexander Hutchinson, Wilkinsburg, and Frederick H. Dechant, Reading, both Past Presidents of the Pennsylvania Society and also from Russell S. Conrad, Editor of *Sparks*, and Secretary of the Harrisburg Chapter.

SEAL OF REGISTRANTS

Section 14 of the Pennsylvania Registration Act No. 415 for Engineers and Surveyors reads:—

"Seal of Registrants.—The issuance of a certificate of registration by the board shall be evidence that the person named therein is entitled to all the rights and privileges of a registrant as long as the said certificate remains unrevoked or unexpired.

"Each registrant hereunder *shall*, upon registration, obtain a seal, of the design authorized by the board, bearing the registrant's name and number and the legend 'Registered Professional Engineer,' or 'Registered Surveyor.' The board, at its discretion, may arrange to furnish each registrant with a seal of the design authoized by it and under such conditions as it may establish.

"Plans, specifications, plates, and reports issued by a registrant shall be stamped with the seal during the life of the registrant's certificate, and it *shall* be unlawful for any person to stamp or seal any documents if the certificate of the registrant named therein has expired or has been revoked, unless such certificate has been renewed or reissued; and it *shall* be unlawful to use the seal or a copy thereof for other purposes than herein specified, or a seal of any other design than that authorized by the board."

The word "shall" has been italicized by us. Webster's dictionary defines the use of shall as here used in these words "As an auxiliary, shall indicates a duty or necessity derived from the person speaking."

It is generally considered that any engineer who does not use his seal has committed a misdemeanor as described by Article 16 of the Act and is liable to the penalties there prescribed. This is the legal phase of the issue.

The professional side seems to be almost entirely in the interest of the individual and the profession as a collection of individuals. We sometimes place the names of the engineers in responsible charge of the construction and design of bridges and other structures on the name-plates of such structures with the idea of informing the public of the value of enginering service as illustrated to the eye by the existing structure. The value of the use of the seal for this purpose should not be overlooked. It does not depend on the permission of anyone. It is not only a right of the engineer but an obligation. When he does not avail himself of its use no one is to blame but himself. But beyond this he must consider what may be in the mind of a commission or other authority when an application is made for the placing of a name plate if the engineer has neglected to use his seal on the drawings, specifications, etc.

It would seem that the Pennsylvania State Code of Ethics would be well amended if a nineteenth paragraph were added placing the Code of Ethics in line with the law in this particular.

ROSWELL CANFIELD

ENGINEERING—PROFESSION OR TRADE?

The report in a construction weekly of a "Supervising Engineers" Union indicates clearly how some engineers think their ambitions may be best obtained. This case is unusual in that an attempt is evidently being made to use a union to create jobs, even to the extent of duplication of the services rendered.

The idea of technical trade unions is not new. Draftsmen, inspectors, and others who do not claim to be engineers, but whose work is allied to engineering, have formed such unions, mainly for the purpose of stabilizing their wages, limiting working hours, provision for overtime pay, working conditions. This is the generally recognized field of the union movement.

That the "Supervising Engineers" are building on a weak foundation is evident as they propose to compel the employment of their members by that most unpopular weapon, the sympathy strike. Whether, having attained their ends by such methods, they, in their turn would be willing to "sympathize" with some other union is a matter for speculation.

The bait for attracting members are rates of pay considerably higher than numerous engineers receive, or even hope to receive. On the other hand, there are many engineers who receive equal or better pay, and who are not at all interested in a "ceiling" on their earning capacity.

It is doubtful if the "Supervising Engineers" get far, especially with such exaggerated demands. Further, the thought of requiring a "union" inspector on work where such service is already provided, and thus arbitrarily increasing the cost thereof, is the direct antithesis of engineering. Engineers are supposed to be able to do things economically.

Naturally, all engineers are interested in the highest remuneration possible commensurate with the services rendered. That is one objective of the National Society of Professional Engineers. That the National Society must not lose sight of this is quite evident. Such movements as this "union" are a direct challenge and require a satisfactory solution.

But—Engineering must solve its problems as a profession, not as a trade union.

MARTIN C. KNABE.

"SPARKS"

Harrisburg Chapter

Pennsylvania Society of Professional Engineers

H. S. MATTIMORE, *Pres.* RUSSELL S. CONRAD,
Secretary and Editor of "SPARKS"

A MESSAGE FROM YOUR PRESIDENT

Every Registered Engineer within our area is a potential candidate for membership in our Chapter. Why not make him an actual active member?

Consider yourself a member of the membership committee and persuade that fellow engineer co-worker to join with us.

Your Chapter is going to be as successful as you make it. Let us make our meetings so interesting that all members will keep a cross on the calendar for the third Monday evening of each month. Your Program Committee will be responsible for alternate meetings when interesting topics will be discussed by assigned speakers. The other meetings will be for business and policy discussions. These latter can be made the most interesting of all if every one will give some thought to the betterment of the organization, and what is of the utmost importance, express their views for discussion.

AIMS of this ADMINISTRATION: 1. Increase our membership. 2. Make our Chapter a factor in Civic betterment. 3. Promote respect for Engineers and Engineering accomplishments. 4. Encourage and develop expression, or betterment of the organization, from all members.

President Mattimore requests the committees meet at least once each month and give a report of their activities at the regular meetings.

RESUME—JANUARY MEETING

The January meeting was held at the Harrisburger Hotel at 6:00 P. M. on January 23d.

The formation of the Johnstown Chapter on January 28th was discussed and Engineer Conrad informed the Chapter that 112 copies of the January issue of *Sparks* were distributed to Professional Engineers in the Johnstown area.

The annual report of committees were received.

President Geiger spoke briefly on what he considered the major accomplishment of the past year, namely, the cooperation of the Society of Architects in legislative and professional matters affecting either or both Societies. It was also reported that the Architects now realize the importance of harmony between the two Societies.

President Geiger with an address of welcome turned the gavel over to the incoming President Engineer Mattimore who gave a short, forceful and inspiring address on the work and aims of the coming year.

President Mattimore then appointed the following committees:

COMMITTEES FOR 1939

Public Relations and Legislative

Ritchie Lawrie, Chairman, F. Herbert Snow, John M. Moltz.

Membership

Fred Poorman, Chairman, H. N. Herr, A. E. Keeley, V. J. Snyder, C. R. Berry.

Attendance and Employment

Allen Jones, Chairman, A. L. Dittmar, F. H. Clutz, C. A. Bryan, M. C. Glace, C. F Germeyer, J. K. Gastrock, J. E. Buch.

Ethics and Practice

Hubert C. Eicher, Chairman, Guy R. Johnson, K. H. Caskey.

Publicity

Wm. S. Hammaker, Chairman, H. H. Miller, R. S. Conrad, V. J. Snyder.

Program

G. A. Rahn, Chairman, A. J. Warlow, J. M. Moltz, I. H. Geiger, H. R. Palmer, H. A. Windisch.

A motion was introduced at the instance of President Mattimore to send the article "Professional Insurance" contained in the January issue of *Sparks* to all non-member Engineers in this territory.

Applications from the following Professional Engineers were presented and approved for membership: Frank E. Lamphere, Karl L. Gatter, Frederick L. Morgenthaler, Jr. and Richard F. Graef.

CHAPTER OFFICERS FOR 1939

President, H. S. Mattimore; Vice-President, John M. Moltz; Secretary, Russell S. Conrad; Treasurer, H. Hershey Miller; State Director, Hubert C. Eicher.

EXECUTIVE BOARD

Irvin H. Geiger, 1939-40-41; Hubert C. Eicher, 1939-40-41; Bowman Snavely, 1939-40; Raymond C. Bobb, 1939-40; Robert Hall Craig, 1939; Wm. S. Hammaker, 1939;

JOHNSTOWN CHAPTER

The Johnstown Chapter was organized at the Fort Stanwix Hotel in Johnstown on January 28, 1939.

There were approximately fifty engineers present at the dinner meeting. There were eight or ten Engineers from the Pittsburgh Chapter, Joseph Stastny from the Midwestern Chapter, "Bob" Craig and Irvin Geiger from the Harrisburg Chapter and the remainder from Cambria, Somerset, Blair, Bedford and Indiana Counties.

Thirty or more members will open the Charter with prospects of this number more than doubled before the end of the year. (Some of the older Chapters had better look to their laurels or the newer Chapters now being formed will outstrip them in membership).

Altoona had a delegation of about eight Engineers who joined the Johnstown Chapter for the present with the intention of forming their own Chapter later.

FEBRUARY MEETING

A regular meeting of the Chapter was held on February 20th at 6:00 P. M. at the UNIVERSITY CLUB at Front and Market Streets.

Mayor Hall and the members of City Council, "Haps" Frank, DeHart, Enders and Fickes with the Secretary Herman Early were guests of the Chapter at this meeting.

Our own member Don Carpenter gave a talk on the Clarks Valley water supply project for Harrisburg.

SPARKS FROM THE ANVIL

The members are exhibiting a real interest in civic affairs and their voice and opinions are having more weight each day. The Professional Engineer both individually and collectively is taking his place in the Sun in this Community. Your State President "Bob" Craig is a member of the Executive Committee of the Harrisburg Area Regional Planning Commission. Others are members of Civic and Public Welfare Committees.

The drive for new members is on. If you are not able to land your Engineer friend call up Fred Poorman or one of his committee. *Get 'em.*

The Engineers—Architects joint committee are meeting each week and you should hear from them in the near future.

Our State Officers have been busy in your interests, however this information will have to be reserved for closed meetings.

THE LEHIGH VALLEY ENGINEER
Lehigh Valley Chapter
Pennsylvania Society of Professional Engineers
Issued Monthly By the Publication Committee—Engineer Hale Sutherland, Chairman

IT'S YOUR JOB, TOO!

By J. H. MORROW, *President*

To the Chapter Membership:

You can serve your Profession and your Society best by remembering that we have integrated ourselves into a unit, in which we who practice the branches of the Profession have a common interest. The technical matters of our Profession may be divergent, but our professional interests are alike.

Your can serve your Profession and your Society by carrying to the attention of your associates all matters pertaining to professional conduct; such as reputed illegal practice, unlawful acts of other bodies, discriminations, acceptance of building plans in a Municipal Building Department without the seal of a licensed Engineer or registered Architect.

You can serve your Profession by acquainting the new personnel of our governmental subdivisions, as well as the old if necessary, with the statutes pertaining to licensed or registered Professional Engineers and Surveyors. It is recommended that the utmost publicity be given to this matter because it is one of the fundamentals of the statute pertaining to the safeguarding of life, health and property.

You can serve your Profession by acquainting industrial executives with the Act of the General Assembly, No. 415, dated May 6, 1927, under which our Profession attained a legal status. Their attention should be called to it, lest at a time of litigation, it be shown that their works, processes, equipment, machines, or structures were not the product of persons qualified by the State to design or plan such works, processes, equipment, machinery, or structures when they involve safeguarding of life, health and property.

You can serve your Profession by faithfully attending all Chapter, Board and Committee Meetings, and when we leave our duties in our specialized fields, we should cease to be electrical, civil, mechanical or chemical engineers and become "Professional Engineers."

HIGHLIGHTS OF THE THIRD ANNUAL MEETING

Despite the very unfavorable weather, the 1939 Annual Meeting turned out to be one of the most successful meetings in the history of this Chapter. Approximately 95 members and guests were present.

To give additional publicity to our Chapter activities, Engineer Alfred E. Roche's address was broadcast through the local radio station, WCBA.

Engineer Roche, President of the New York State Society of Professional Engineers, outlined the past history of engineering in the States of New York and Pennsylvania. He spoke, then, on the future accelerated advance in the accomplishments of engineering:

> "It is essential that production machines and farm produce be accelerated each decade. More backs are to be clothed, more mouths to be fed, more feet to be shod; thus more scientific ways of doing jobs must be initiated.
>
> "Such equipment changes will inevitably shorten the worktime required to satisfy the public demand for all goods. Whatever this reduction may be, it will result largely from the activities of the Engineer. This is a task which the profession accepts."

With reference to the legal aspects of the profession, Engineer Roche mentioned:

> "Engineer's registration is required for the protection of the public. The work of no other profession more truly concerns the safety of life, health, and property.
>
> "The general public needs to be protected against improper planning, inefficient designs, wasteful execution and excessive cost, also against dishonorable dealings.
>
> "There seems to be a consciousness on the part of public and leaders of public affairs that engineering is playing and will continue to play an increasingly important part in the activities of modern world."

Following Engineer Roche's address, the retiring Chapter President, Engineer Pidcock, gave the annual President's Report. Unfortunately, limited space does not permit us to reprint his report in full, but, for the benefit of those unable to attend, we give a brief summary:

Meetings: During 1938, six regular meetings, in addition to the annual meeting, were held by the Chapter. There were nine meetings of the Board of Directors.

Visitations: The Chapter was represented at the State and National Conventions by the President, Secretary, and Treasurer. President Pidcock, Vice-President Payrow, and State Director Gish, attended a meeting called by the State President in Harrisburg, in February. President Pidcock and Engineer Morrow attended a Reading Chapter Meeting in Hamburg, Pa., in September. A delegation of six members were present at the West Jersey Chapter meeting at Washington, N. J. Past President Ramage represented the State and National Societies at the dedication of Franklin Institute in May. We enjoyed the presence of a number of visitors from the nearby Chapters.

Membership: Chapter membership was increased from 72 to 96 members. This total represents 63% of the Registered Engineers in our District.

Finances: 79 of the total membership have paid their dues for 1938. The year closes with $38.20 in the treasury, with all bills paid.

Activities: Honorable mention goes to the Membership and Ethics and Practice Committees. During the year, a special Registration Committee was inaugurated to advise prospective registrants. The early part of the year saw the launching of the *Lehigh Valley Engineer.*

A resolution designed to awaken "professional consciousness" in the minds of engineering students, drafted by Professors Sutherland and Lohr, was forwarded to the State Society and to the heads of engineering institutions.

Engineer Ramage made initial steps toward the formation of a Chapter in the Scranton area.

The publishing of a Roster of Registered Engineers in the Lehigh Valley area was proposed and initial steps thereto were taken.

Remarks: "As retiring President of the Lehigh Valley Chapter, I want, at this time, to express my appreciation and thanks for the fine cooperation of the entire membership and officers during the past year, and to ask that the same support be given to the incoming administration."

Recommendations to incoming officers: "Do not lose sight of the goal to be obtained and the purposes of the organization in the rush to advance and grow. We can not compete on the membership basis with other organizations and it should not be our objective to do so. Do not imitate the technical meetings of

Founder Societies; continue on the already established principles. To facilitate attendance, simplify dinner meetings and reduce cost of such meetings to a minimum."

CHAPTER OFFICERS FOR 1939

President, Joseph H. Morrow; Past Presidents, G. Edwin Pidcock, Harry L. Ramage; Vice-President, H. G. Payrow; Secretary, V. W. Anckaitis; Treasurer, R. E. Huthsteiner; State Director, Charles E. Lehr; Chapter Directors, Merritt E. Boyer, Joseph B. Gaffney, Leonard Fraivillig, Hale Sutherland, Attorney Joseph B. Walker, F. C. Peters.

REPORT OF THE PRESIDENT, PITTSBURGH CHAPTER, P.S.P.E.

On January 1, 1938, this Chapter was two and one-third years old and had already under previous administrations been organized into a going concern. The membership had reached the number of 135 and the foundations in the formation of a local professional society for engineers whose one idea was the welfare of engineers of every kind was well under way.

It is proper, once a year, to review our accomplishments, our reverses, not from any wish for self-aggrandizement, but as a means to determine the results of our acts and to plan the course of our future efforts to advance the engineering profession.

During last January with the assistance of the Board of Direction and the chairmen of the Standing Committees the following nine-point program of objectives for the Pittsburgh Chapter was projected:

1. To accomplish greater cooperation with other Chapters and the State and National Societies; to effect an increased solidarity of action on the part of the various units.

2. Continuance of an active campaign for the increase of Chapter membership.

3. Continuance and extension of cooperation with the Technical Societies and the cultivation of mutual good-will.

4. To effect a closer reapproachment as between engineers and architects and a better understanding and coordination of the ethics of each group. To these ends a joint committee is recommended.

5. To make all engineers more ethics conscious.

6. To insist upon the proper remuneration of all engineers commensurate with the value of the service rendered the public by members of a learned profession.

7. To build up and to make available within the Legislative Committee a wealth of information as to the legal phases of the License Laws.

8. The continuance and improvement of the Chapter publication, *The Pittsburgh Engineer.*

9. To set up and implement procedure on a simple and accurate audit of the financial phases of the Chapter.

It is not asserted that these objectives have been occupied and therefore can be considered finished business, but that real ground has been gained towards realization of all. Particularly have we been able to make progress in the case of numbers 4, 7, 8 and 9. To some extent the same is true of numbers 1, 2 and 5 while for numbers 3 and 6 our efforts may seem rather barren to observable results.

Some of you may know something about the White Pine. The first five or six years this tree shows very little growth above ground but the truth of its basic strength soon comes to light as it proceeds to catch up with its competitors and to ultimately equal or exceed all at maturity both in beauty and use. I think this illustrates the Chapter. Our roots are spreading and the foundations are being laid true. It is believed already the individual engineer begins to feel its good influence to improve unity and those everyday contacts and others not attempted by the older technical societies.

The outstanding activities of the Chapter were as follows:

(a) The recognition and placing on record in the Courts of Allegheny County the exclusive right, as defined by Act of Assembly, to practice the profession of engineering in cases before these courts. This was accomplished through the efforts of the Chapter Legislative Committee, Engineer Devlin, Chairman.

(b) The successful organization and carrying through of the 1939 convention of the National Society of Professional Engineers held in Pittsburgh, October 17, 18 and 19, 1938. This convention was not only an inspiration in professional aims and procedures but was carried on without one cent of expense to the Society. The convention was managed by the 1938 Convention Committee—National Society of Professional Engineers under the able leadership of Engr. Samuel Eckels, Chairman. You are referred to the report of this committee for its personnel, all of whom, together with its chairman, are commended for their great work.

(c) The legal cases against the Chief Engineer of the City Planning Department for practicing engineering without being first registered in accordance to law were instituted last spring. The Ethics and Practice Committee has followed these cases for the Chapter in a most gratifying manner, maintaining at the same time a dignity comensurate with a learned profession and an unswerving path toward the elmination of the unlawful practice of engineering. The final issue of this case in the County Courts was heard December 14, 1938, and December 15, 1938, a decision was handed down. A copy of the decree was sent to each member of the Pittsburgh Chapter the early part of this month. Mr. Fred Shoemaker of Pittsburgh is acting as the Chapter Attorney in these cases. In addition to the legal case, the Chairman of the Ethics and Practice Committee, Engr. F. G. Ross, together with the Chapter Secretary, Enginer Aires, have conducted a concerted campaign to eliminate the illegal use of the title "engineer" or "engineering." Most of these cases have been amiably and satisfactorily settled There are some legal technicalities in this issue that need clarification. It is hoped this may be accomplished in future sessions of the legislative. It is gratifying to find so many individuals and corporations sympathetic to our position on this issue.

(d) We are glad to advise the Chapter that the Pennsylvania Society of Professional Engineers in cooperation with the Pennsylvania Association of Architects has appointed a joint committee to promote the mutual cooperation of the two societies both towards legislation and inter-professional ethics.

(e) The accomplishment of the Chapter Publications Committee headed by Engr. Earl Dwight Covell, Chairman, who have placed in your hands twelve issues of the *Pittsburgh Engineer* to date is self evident. The editorials appearing in these issues have drawn favorable comment both from the State Society and the National Society. I am sure the *Pittsburgh Engineer* has won a permanent place as a meritorious activity of the Chapter which will insure its continuance. It needs your support.

(f) The Chapter has been instrumental in the organization of one new chapter in the State—the Mid-Western Pennsylvania Chapter and has the assurance of the organization of a second new chapter on January 28, 1939,—the Johnstown Chapter.

All of these things are made possible by your support as members of this Chapter. The payment of your dues is not the only need of the Chapter, important as that is to us. We need your attendance at our meetings, your counsel and work on our committees. All of these things are necessary to the Chapter's well being. The position and esteem of the professional engineer before the public is in the hands of the individual engineer. It should be unnecessary to explain to engineers the results of united effort. The Professional Engineers Society offers a vehicle for our united efforts.

WASHINGTON

Election of officers of the Washington Society of Professional Engineers was held at the Annual Meeting, January 20, 1939, at State Headquarters Offices, 865 Empire Building Seattle, Washington.

Result of election:

President—James W. Carey, Consulting Engineer, and member of Alaska State Highway Commission, 1017 Boren Avenue, Seattle, Washington.

First Vice-President—Leland J. Wright, County Engineer of Skagit County, 1300 11th Street, Mt. Vernon, Washington.

Second Vice-President—Clarence F. Griggs, County Engineer of Spokane County, West 111 Seventh Ave., Spokane, Washington.

Executive Sec.-Treas.—Karl F. Vaughn, Consulting Industrial Engineer, 865 Empire Building, Seattle, Washington.

Col. W. C. Bickford assented to remain National Director for the State Society until his elected successor had formally accepted the election to the National Directorship.

KARL F. VAUGHN,
Executive Secretary.

The Engineer's Place In Civilization

(Continued from page 6)

Give the Engineer an opportunity and he will also solve the problem of coordinating the results of his work with the needs of Society.

Engineering is a mode of thought. It is characterized by scientific, impartial analysis of a problem, honest evaluation, and logical conclusion.

The Engineer has been blamed for the problems arising from the machine which he created. Why not give the Engineer an opportunity to tackle the task of adjustment and coordination?

Professor John Dewey, the chief exponent of the philosophic doctrine of experimentalism and pragmatism, has for years urged that the Engineer and the doer have a greater place in American political and economic councils.

Those who have assumed responsibility in organized society for the controls of the business machine should have regard for the processes of thought of the Engineer,—the methods of analysis which have enabled the Engineer to predict the performance of the machine, the factory, and the power plant even before it is created.

The Engineer is fundamentally a servant of society and human progress. He is trained scientifically and practically to evaluate and predict demands, and to plan and proportion most efficiently the machinery to meet those demands. The Engineer is also trained to plan the *balancing* of the interrelated elements of a production or power system, however complex, and to design regulating and protective devices between the different parts of the system for the automatic adjustment and control of power and load. Moreover the Engineer of today has been forced to broaden his mental equipment and outlook beyond the strictly technological, and to include application of the principles of economics and business, sociology and psychology, in the comprehensive solutions of his problems.

Today society needs the Engineer. He stands ready to give his services, not to further selfish ambitions, but to cooperate with others in saving civilization from the prolongation and repetition of economic derangement.

In the future, the Engineer will have to deal more and more with problems outside the field of purely technical science. He will have to measure men's wants and needs, and proportion industry's work to suit. He will have to forecast the evolution of cities and states in order to plan construction requirements intelligently. He will have to help in planning the social mechanism in order to assure men against the blights of idleness and poverty. Whatever his problems, the analytical attack of the Engineer—the Engineering method—should be indispensable in the continuing advance of social order, prosperity and civilization.

Dr. Carl T. Compton has concisely expressed the relationship between Science and Engineering as instruments of social progress: "Science seeks to understand nature while engineering seeks to control nature." The distinction has also been aptly stated by Dr. Gano Dunn: "Engineering is the art of the economic application of science to social purposes. The scientist shuts his mind as far as possible to all human prejudice and influence of feeling, save only for the divine fire of that imagination which creates the working hypothesis; and he learns how to discern truth and new knowledge in a study of the order of nature. The engineer, by the same intellectual processes as the scientist, applies that new knowledge to social service."

The Engineer not only applies and makes useful the discoveries of the Scientist, but he also today supplies the Scientist with the very tools and instruments for his exploration of the unknown. From the giant telescope for studying the vast unsounded regions of microcosmic space to the powerful machine releasing thunderbolts to shatter the atom and explore its microcosmic mysteries, the tools of scientific discovery are produced by the Engineer.

Engineering may also be defined as the application of "intelligent resourcefulness" to the utilization of our "natural resources." Although enormous energy resources have already been tapped and made useful to us by scientific discovery and engineering application, all this is but a minute fraction of the vast potentialities still untapped. Every human being can be made thousands of times as wealthy as he is today. The political demagogue and the economic crackpot cannot do it. Only the Scientist and the Engineer can find the way.

Stuart Chase has expressed the conviction that the salvation of our economic structure lies in the Engineer. He has described the *engineering mind* as "professional, not commercial; dedicated to building, not to profit making; that is free of false modesty and has the courage to accept the job of taming the billion wild horses which Watt let loose; that thinks straight and hard; hates waste and confusion, dirt and despair; that never stoops to the shoddy or the adulterated."

It is for the *engineering mind* that we find an increasing participation of the Engineer in management,—the increasing predominance of engineering—trained men in finance, production, distribution, and sales.

It is the *engineering mind* that is equipped for leadership in these days of vexing economic and social problems.

It is the Engineer who, because of his professional status, stands today in an intermediate and neutral position between capital and labor. He deals objectively with both. The Engineer is peculiarly qualified by position, training, and experience to resolve the schism between capital and labor,—to cut through prejudice, and bring about that reciprocal confidence, understanding, and cooperation so sorely needed in our industrial society.

Speeding across the country in an airplane, we look down upon white, fleecy cumulus clouds like islands in a lake; and on these sunlit clouds we see the fleeting shadow of the plane in which we are riding. There we are, *between the top of the clouds and all eternity*, in a machine that was built by man! Not by one man, not by two, but by generations of men. Somebody had to discover how to dig down into the bowels of the earth to mine metals; somebody had to discover electricity and how to use it; somebody had to discover oil and learn how to refine it and make gasoline, and somebody had to invent the gasoline engine; somebody had to discover the principles of wing design and the laws of flight. Countless scientists, inventors, experimenters, designers, and builders contributed to this achievement. It was the achievement of Mankind,—another contribution of Engineering to Man's mastery of his environment.

To fling a span across a great stream, to reclaim a desert, to build a railroad across a continent, to harness a mighty waterfall to light the streets and drive the machinery of distant towns, to bring a river of pure water through mountains and under deep gorges for the supply of a metropolis,—all these are works of vision and constructive achievement. But the men who give their lives to these feats as their daily tasks are unknown and forgotten.

Of the multitudes who cross a mighty span, or enjoy the speed and comfort of a great railway system, or occupy a modern skyscraper, few ever give thought to the Engineers who, after years of training and preparation, conceived those great works, calculated and designed every detail, and planned and directed every step of construction.

About all the Engineer gets is the personal satisfaction of mighty forces mastered, difficult problems solved, and work well done,—all in service to his fellowmen. And through it all is the high strain of responsibility, with the safety of many lives dependent upon the Engineer's skill, accuracy and thoroughness.

The Engineer, of all professional men, is the greatest contributor to the economic progress and wealth of the community.

It must be remembered that Engineering is the science and art of *economic* construction. The Engineer has to make one dollar do the work of three, and he has to enable one man to do the work of three. Before an engineering enterprise is undertaken, the Engineer has to investigate its economic and social justification, and he must show how, by reducing expense or increasing income, the project will be a real contribution to economic progress.

The outstanding value and supreme importance of the work of the Engineer in our civilization should be recognized. *The Engineer has done more to promote human comfort, wealth and safety than the members of all other professions combined since the world began.*

The community or nation that best develops and applies the brain power and inventive genius of the Engineer will be the most prosperous.

Some years ago I was asked to write a word-picture of the Engineer and his work. Although it has appeared in various publications, I offer it here as a summarized statement of the Engineer's role in Civilization:

THE ENGINEER

He is the master of the Laws of Nature. On a sound foundation of mathematics, science, and economics, he bends the materials and forces of Nature to his plan and rears the structure of civilization. With vision, resourcefulness, and ingenuity, he labors to increase the comfort, wealth, and safety of his fellowmen. He attacks his problems with the vision of the pioneer, the integrity of the scientist, the accuracy of the mathematician, the practicality of the business man, the resourcefulness of the inventor, and the courage of the conqueror. He is the planner and builder. He builds his visions into enduring realities. He is the pathfinder of civilization. He breaks down barriers, bridges, chasms, establishes communication, and straightens the way for commerce and human progress. He is the protagonist of efficiency. He reduces effort, eliminates waste, and increases production. He is the creator of a Nation's wealth. He drains the swamps, reclaims the deserts, develops resources, and harnesses power. He builds the machinery of industry, the wheels of commerce, and the structure of business. He is the great coordinator. He plans and directs the construction of projects representing the investment of millions of dollars and involving the labor of thousands of men. He investigates with open mind, and gets the facts before he makes decisions. He plans with thoroughness and builds with fidelity. To his rich heritage from the labors of past generations of engineers and scientists, he adds his contributions. He continues the work of forcing outward the challenging barriers that separate Man's efforts from the impossible.

In the Middle Ages, many inspiring lofty cathedrals were built. They were monuments that transcended the matter which constituted them. They were more than architectural wonders,—they were spiritual affirmations. They symbolized the aspirations of the masses,—their striving toward the ideals of beauty, hope, and religious faith. Those cathedrals, from their foundations in the dark depths to their towering spires pointing toward Heaven, were

like the masses, rooted in poverty, but inspired by faith and vision to build upward toward the stars.

During the building of one of these cathedrals,—the story is told,—a visitor passing through the stoneyard saw many masons busily at work, hewing and shaping the granite blocks. He paused and asked one of the men what he was doing. "I am shaping the face of this stone," was the reply. Proceeding a few paces, the visitor addressed the same query to a second stonecutter. This man replied: "I am cutting the keystone of an Arch." A little further along, the visitor paused and repeated his question to a third workman who was similarly engaged. This man looked up and, with proud dignity, replied: "Sire, I am building a cathedral!"

And so, when you ask what the Engineer does,—the reply is not just the turbine or the dynamo, the locomotive or the steamship, the cable or the radio, the dam or the tunnel, the railroad or the highway, the bridge or the skyscraper. With all these things, the Engineer, too, is building a cathedral,—a glorious resplendent structure representing the ultimate realization of Humanity's hopes, dreams, and aspirations. *The Engineers building the Cathedral of Civilization!*

Engineering Education of Tomorrow

(Continued from page 8)

The Doctor of Engineering will go into industry more mature and more fully prepared than is any product of the present system. He alone will deserve the title of Engineer, and the statutes will no doubt be modified to protect that title. He will then be in a class separate from that of the bachelor's degree graduates. Unless this distinction is made, the title of Engineer will never reach a "learned" status, will always smack of pipe fitting, straw bossing, and overalls. The status of physicians in society would not be what it is today, had they included in their classification, nurses, laboratory technicians, orderlies, and hospital mechanical staffs. It is not that the latter servants of society are unnecessary, but that the community accords prestige to only the creative scientist or professional man. Any attempt to force on the community by artificial means more respect for the engineer and his profession is doomed to failure unless the underlying education, and the duties regularly performed, are such as naturally to command that respect.

With the distinction clearly drawn between the servicing of industry and professional engineering, the Engineer, or Doctor of Engineering, will automatically attain all the honor and respect due his title, his learning, and his contributions to society. Through him the engineering profession will be vindicated while for him will have been sacrificed the doubtful status of the larger body of graduates servicing the community in the routine operation and maintenance of the technical industries.

New Administrator

Article 55 of the Education Law directs the Education Department of the State of New York to administer the statute, under which the engineer is licensed to practice the profession.

For the past eight years, Dr. Harlan H. Horner, Assistant Commissioner for Higher Education, has been the administrative head of the Department through which the profession functions. He has accomplished some noteworthy advances in the administration of the law. Dr. Horner recognized this Society as the spokesman for the profession. He has been succeeded by:

Milton E. Loomis, Associate Commissioner of Education since February 1, 1939, in charge of higher and professional education, was graduated from Western Reserve University in 1909. He pursued graduate studies in the field of social sciences in the Universities of Chicago and Wisconsin, and in 1913 became a member of the faculty of New York University, remaining with that institution until his recent appointment to the State Department of Education.

At New York University, Mr. Loomis was, at various times, registrar of the University, assistant dean of the School of Education, director of the Summer School, and dean of Washington Square College. He left the last named post in 1937 to spend a year's leave of absence in special study in England.

During the year 1935-1936 Mr. Loomis was president of the New York State Association of Colleges and Universities, and for the year 1936-1937 he was a member of the Commission on Institutions of Higher Education of the Middle States Association of Colleges and Secondary Schools.

The Connecticut Society of Professional Engineers, Inc.

Report of the State Membership Committee, March 1939.

The objective of the CONNECTICUT MEMBERSHIP COMMITTEE is to have all legally qualified and truly ethical Professional Engineers in the State of Connecticut, enrolled as members of the CONNECTICUT SOCIETY OF PROFESSIONAL ENGINEERS and the NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, INC. Of course, this is unattainable immediately, so the hoped for results are to enroll all of the registered men who are up and coming with a broad interest in life and in the improvement of their profession and its economic status through effort and unity.

Improved educational methods, better registration laws and the advancement of professional ethics and principals brought about through the efforts of our Society will eventually produce, by selective processes, a profession with a better inherent, basic human composition than we can now claim for it. Therefore, we feel that Membership Committees should not worry about the minority that they find backward, but should expend their efforts in interesting the really worthwhile non-member engineers in our owrk.

From September 1934 to December 1938, the only Chapters in Connecticut were the Stamford and Bridgeport Chapters. Getting new members is not an easy proposition if there is no local interest and representation. With this in mind, the Membership Committee contacted on December 1, 1938, members who resided in Waterbury and got them to organize themselves into a new Chapter, known as the Waterbury Chapter, Connecticut Society of Professional Engineers. The officers being as follows: President, Eng. Herbert H. Scott Smith, 1st Vice-President, John C. H. Wendes, 2nd Vice-President, Eng. J. H. Roberts, Treasurer, Eng. Wendall P. Vial, Secretary, Eng. Frank E. Kliest, State Director, Eng. C. T. Wilson.

This was followed with the first regular meeting and dinner of the Waterbury Chapter, Wednesday, December 14, 1938, with Eng. Frederick Zurmuhlin, Chairman of the National Membership Committee as guest speaker. Engineer Zurmuhlin spoke very strongly of the reasons and advantages of organizing the Professional Engineers into one body, which represents his thoughts and actions as outlined in our Code of Ethics, also our Objectives. Engineer Zurmuhlin made it quite clear that only those who have qualified and received registration are the only Engineers who can legally and ethically represent the Engineering Profession and they in turn can do this by membership in the CONNECTICUT SOCIETY OF PROFESSIONAL ENGINEERS, which was, with its predecessor, THE CONNECTICUT CONFERENCE OF PROFESSIONAL ENGINEERS, the prime mover in obtaining the passage of the Registration Law in Connecticut and made it possible for them to receive their recognition.

Engineer Harry E. Harris, National Director from Connecticut also gave a splendid and timely twenty-minute talk relative to a bill before the Connecticut State Legislature which would put the Connecticut Board of Registration and all other licensing boards (except the legal profession) under the control of a single Executive Secretary, the objections to which are obvious to all Engineers and need not be mentioned here, however, Engineer Harris substantiated Engineer Zurmuhlin's talk to the effect that if the Professional Engineer wishes to retain his Professional status, he must shake himself loose from his lethargic complex and find out what the other fellow is doing and protect his interest in the Legislative Bodies.

These talks were followed by a moving picture of the hurricane which swept over New England, September 21, 1938. This meeting had a large attendance of Registered Professional Engineers, despite the fact that there were two other meetings of engineering organizations held that same night in Waterbury.

The next move of the Membership Committee was formulated on the night of this Waterbury meeting by members who reside in Hartford, and who were anxious to start a Chapter in their locality. With their enthusiasm, a Chapter was organized by them in Hartford, with the help of the Membership Committee, known as the Hartford County Chapter, on January 19, 1939, with officers as follows: President, Eng. Robert W. Loomis, 1st Vice-President, Eng. Percival L. Davis, 2nd Vice-President, Eng. Henri B. Van Zelm, Secretary-Treasurer, Eng. Wm. J. Carson.

With the help of this new Chapter acting as a Committee on Arrangements, plans were made for the Sixth Annual Congress of the Professional Engineers on January 27, 1939, to be held in Hartford. The date was set by the Guest of Honor, Governor Raymond E. Baldwin of the State of Connecticut. Guest Speaker, Eng. John C. Riedel, Vice-President, NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, INC., who gave a most interesting talk on what would otherwise have been a dry subject, namely, the Model Law, the Committee for which he is National Chairman. Governor Baldwin was introduced to the Engineers present as well as the radio audience over Station WDRC, by Carl Gotthardt, Chairman of the Congress. The Governor's address was virile, and on vital matters confronting government. In particular it was enlightening to the engineers present in that his talk showed familiarity and an effective understanding of public engineering problems and of the traditions, field and scope of the profession. (The Governor is a member of the Connecticut Judiciary.)

The Governor invited the CONNECTICUT SOCIETY OF PROFESSIONAL ENGINEERS, to co-operate with him and the GENERAL ASSEMBLY in the efforts to solve Flood Control problems as well as Highway Safety, Highway Lighting and Automobile Inspection and any other subjects of an engineering nature and paid a tribute to what the SOCIETY had already accomplished along these lines.

Engineer John C. Riedel traced the activities of mankind in relation to his own safety and struggle for existence and the many devices and artifices he was called on to create during the span of mankind up to the present time. He stressed that, now, more than ever, the men who build and control engineering projects should be held responsible for their work and if not responsible and well qualified, they should not be recommended or permitted to carry on.

He reminded the Engineers present that forty States now have engineering laws to regulate the responsibility of engineers. He also stated that these Engineering or Registration Laws were necessary to "safeguard the interest of the public and to preserve life."

After Engineer Riedel's talk, an Open Forum was conducted by Eng. Harry E. Harris as referee to discuss resolutions and proposals affecting engineering and civic legislation now before the General Assembly, thus bringing the present problems of mankind back to the engineer for his actual participation and action.

Respectfully submitted,

CARL GOTTHARDT, Chairman,
STATE MEMBERSHIP COMMITTEE,
CONNECTICUT SOCIETY OF PROFESSIONAL ENGINEERS.

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